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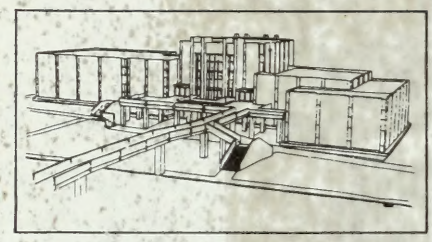

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72°
71°
70°
69°
LANCASTER SOUND
Tununirusirm
Kangertlung
Aqbirmarbing
Saming
Qaqodluin
Qordlartang
Uivang
Tudjan
Uglirn
Agpan
Augpartung
Qegertuqdjung
Tatiruaedjung
Numing
Umaqdjung
Tununirn
Satung
Imigen
Imiling
Bylot Island
Uivang
Nuvujen
Agpan
Pingualung
Sednirtan
Qarsaq
Qimaromanirn
Torsuqateng
Aulitiving
Qimiving
Qaqortaq
Qaqortuaqdjung
Qordlnuatung
Kangertlung
Angmang
Kangertlaping
Kangertluaqdjung
Exaluin
Turnirn
A g g o
III
Plateau of
Nugumiut
Akuliaq
Exaluin
Umiangyuing
Qaumarung
Aggaun
Nangarang
Sessuijaqdjuaq
Sarqa
Qairoliktung
Qegertuqdjuaq
Qegerten
Qimaruktualung
Kangertlung
Qernirtung
Tinirqsuarbiusirn
Kingnait
Qaudjuqdjuaq
Kangertlukdjuaq
Minartung
Umanak
Qussiqaqdjuaq
Qegertuqdjuaq
Qaiairnang
Qeqertuqdjuaq
Aqbirsiarbing
Satuirtung
Ikerassaqdjuaq
Qaumauang
H U D S O N
S T R A I T
Pribilers Hrb
Qutaqdjung
Tudjaqdjuaq
(Resolution I.)
Nuvarudligang
Iglulik
Nivaruk
Ijellirtung
Arqtun
Tingaqdjung
Kangeqsisu
A K U L I A K

68° 67° 66°

Aulitiving
Siorartijung
Tellirujang
Tidliellung
C.Kater
Qingmiellung
Nuukteling
Anarrutung
Nisqongnang
Nisqongnausirn
Audniro
Avaudjelling
Kingniltung 150m
Jadhutelling
Tettaujang
Jugtonerbing
Agdlirating (125m)
Pangnertung
Qipergein
Qeqertalokadlen
Idjertung (10m)
Qeqertaloriaq
Pissingnerbing
Idjuparbing
Kangaunang c100m
Satigsuit c180m
Nudlung
Kooper
Pujetuaqdjung
Nanuqangnang
Aglingujang
Tupirbikdjuraitjung
Pilentuaq (Hang Cliff)
Nanuqtaqdjung
Qeqertalukdjuaq
Atdlirn
Manitung
Pangnirtung
Nedluqseaq
Alausikulu
Nuqatoaqsin
Alausirn
Atiqdjaaq
Tikerelling
Atterelling
Matsaujang
Nettin
Kangeeaqdjung
Pamiujang
Nunasseaq
Qivitung
Tunirn
Idjuniving
Kangidlirn
Qeqertarnaq
Qeqertarnausirn
Amaroqtelling
Maujatuusirn
Koadlitling
Tessiujang
Qajonginang
Aulisayatung
Angneiling
C.Broughton
Qeqertuqdjuaq
Pudletonjang
Qeqertaqdjuin
Ijeqdjuaq
Qiktorianiq
Aulitiving
Qeqertaq
Umanaq
Angpalukissaq
Idlaulitung
Qoqurbing
Qeqertalukdjuaq
Tulukan
Qingmiqdjuling
Tikerelling
Niaqongnang
Pangnirtung
Nedlugseaq
Pamiujang
Qqoa
Uglirn
Nanissaralang
Tessiujang
Kangeeaqdjung
Avaudjelling
Siorartijang
Qajodlwin
Qajodloaping
Padlopin
Manitung
Qeqertalukdjuaq
Qujaun
Qxilejung
Qeqertaq
Naujan
Tunnirn
Pilitdung
Padlopin
Padlirn
Piqurtung
Akuliayating
Avuliqong
Panissung
Simiutang
Anersiariailjung
Pangnirtung
Kangertloapirk
Penny
Plateau
Qeqertaq
(King William Land)
Ikerassaq
Padhaq
Tessiraqdjuq
Qingaq
Ovrutta
Tangiatlaqjua
Ita
Naujan
Kuna
Uglulik
Qingmiktung
Qeqertuqdjuaq?
Umiaktalik
Umanaqdjuaq
Kugnuaq
Siorakulu
Tessiqdjuaq
Itumnaqdjuq
Fyallartung
Nanisivik
Arctic Bay
Pond Inlet
Qamanikuluk
Imeraqdjuaq
Kitigtung
Imiangyang
Qolidjuin
II

70°
69°
68°
67°
66°
R SOUND
Bylot Island
Uivang
Nuvujen
Agpan
Pingvalung
Sednirun
Torsuqateng
Qaromanirn
Qarsaq
Aulitiving
Qimiving
Qairnirmatung
Kangerllung
Tiriarn
Exaluin
III
Plateau of
Nugumiut
Qairoliktung
Qeqertuqdjuaq
Qaudjuqdjuaq
Kangerlualuk
Qernirtung
Umanartung
Tiniqquarbiusirn
Kingnait
Siggia
Kitugtung
Umiangyang
Ikerassaqdjuaq
Qeqertuqdjuaq
Qaumauang
Tudjaqdjuaq
(Resolution I.)
II
Auli-
trvik-
djuak
Aulitiving
Siorartjung
Tellirujang
Ijellirtung
Arbaqtung
Itirbilung
Itidliellung
C. Kater
Koukteling
Augpatulissaq
Qingmiellung
Nagdongmausirn
Anarnatung
Uviung
Tingin
Audairn
Avaudjelling
Kangmitung 150 m
Agajartung
Idbluelling
Tettaujang
Tingtonerbing
Sagdlirn
Adliroling (125 m)
Pangnartung
Qiporqain
Qeqertalokadlen
Okkan
Idjortung (10 m)
Saloartung
Qeqertaloriaq
Kangiqsin
Pissingnerbing
Idjuarbing
Savdlsonitung
Kingaunitung c. 100 m
Satigsun, c. 180 m
Exeluaqdjuin
Nudlung
Fluoper
Aqbingajang
Pilelluaq (Hang Cliff)
Qeqertalukdjuaq
Adlinirn
Manitung
Pangnirung
Nedluqseaq
Nettin
Pamiujang
Nunasseaq
Qivitung
Qglirn
Kangidlirn
Qeqertarssuaq
Maujatunsirn
Nedlugseaq
Pamiujang
Qqoa
NARPAING
Penny
Plateau
Ugjulik

Qeqertaq
ng William Land
Ovrutta
Ikerasarag
Padlaq
Tessiriaqdjung
Qaggiortung
Tikeraqdjaq
Qeqertaqdjuaq
Tikipoq
Ornatjoq
Tululiktoq
Angmalortoq
Akuliruktoq
Tessiqdjuaq
Qingaq
Netchillik
Aniqaq
Kangiarliaqdjuq
Kuna
Naujan
Qingmiktung
Qeqertuqdjuaq
Umiaktalik
Umanaqdjuaq
Kugnuaq
Siorakulu
Tessiqdjuaq
Itumnaqdjuq
V
Amaroqtelling
Auliayatung
Kingnelling
C.Broughton
Qeqertuqdjuaq
Ijeqdjuaq
Qiktorianga
Qeqertalukdjuaq
Tulukan
Qingmiqdjuling
Qaxodluin
C.Searle
Niaongnang
Tikerelling
Pangnirtung
Padlopinga
Manitung
Qeqertalukdjuaq
Qujaun
Aggidjen
Durban I.
Amitualdjuaq
Agperiarfung
Aspan
Okan
67°
Qeqertaq
Naujan
Tununirn
Pilulong
Kangertloapin

Penny Plateau
Qeqertuqdjuaq
Tudjaqdjuaq
(Resolution I.)
II
Kingnait
Tiniqdjuarbiusirn
Pritzlers Hrb.
Qeqertuqdjuaq
Tudjaqdjuausirn
Nugumiut
Qairoliktung
Qaudjuqdjuaq
Ukallia
Siggia
Kitigtung
Umanaq
Qarnirtung
Kangerlukdjuaq
Qaumauang
Ikerassaqdjuaq
Agbarsiarbing
Samirtung
Umiangyang
Nyxolidjuin
Qeqertuqdjuaq
Nugumaut
Qarnirtung
Kangerlung
Qeqertuqdjuaq
Qaumauang
Pritzlers Hrb.
Qaladqdjung
Tudjaqdjuausirn
Tudjaqdjuaq
(Resolution I.)
II
Penny
Plateau
Pyxalurtung
Qamanikuit
Imeraqdjuaq
Ipuqsang
Ijjarelling
Exaluaqdjuin
Qorbikun
Amitoq
Itidlirn
Iaute
Numarliktung
Kangidlielung
Audnerbiellung
QINGUA
Qeqertelung
Exaluaqdjuaq
Ukiuqdjuaq
Qitalle
Nunatang
Manituling
Qerniqdjuaq
Itidliaqdjung
Exoleaqdjuin
Aulitiving
Porussiara
Ussualung
Qordlubing
Numerous Islands
Sedrirun
Augpaluguing
Atdlinirn
Qavaraqsirtung
Tupirbikdjuin
Naivaun
Angiuqaq
Tornait (Kingnait II.)
Aturaqa
Nettilling Fjord
Imigen
Tessiujavodlang
Qeqertaluk
Qeqertuqdjuaq
Qarsaq
Tuapain
Tunikten
Qeqertaluk
Qeqertalung
Ikerge
Nuvujalung
Nuvujen
Majorariaqtudlirn
Qairsuahng
Segdjuqan
Qimussuk
Imuarudligang
Exaluin
Irselung
Umanaqmaq
Qeqertelung
Kautaq
Oaxodlun
Nudlung
Kiagtung
Imukanaqdjung
(Qeqertalung)
TINIQDJUARBING
TALIRPIA
Ukiuqdjuaq
Qitalle
Pitiu
Aulitiving
Porussiara
Qordlubing
Qavaraqsirtung
Atdlinirn
Tupirbikdjuin
Naivaun
Angiuqaq
Tornait (Kingnait II.)
Aturaqa
Nettilling Fjord
Qeqertuqdjuaq
Qarsaq
Tuapain
Tunikten
Qeqertaluk
Qeqertalung
Nuvujalung
Nuvujen
Majorariaqtudlirn
Qairsuahng
Segdjuqan
Qimussuk
Imuarudligang
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Irselung
Umanaqmaq
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Kautaq
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(Qeqertalung)
TINIQDJUARBING
TALIRPIA
Nunatang
Manituling
Numerous Islands
Sedrirun
Augpaluguing
Ussualung
Aturaqa
Nettilling Fjord
Imigen
Qeqertuqdjuaq
Qarsaq
Tuapain
Tunikten
Qeqertaluk
Qeqertalung
Nuvujalung
Nuvujen
Majorariaqtudlirn
Qairsuahng
Segdjuqan
Qimussuk
Imuarudligang
Exaluin
Irselung
Umanaqmaq
Qeqertelung
Kautaq
Oaxodlun
Nudlung
Kiagtung
Imukanaqdjung
(Qeqertalung)
TINIQDJUARBING
TALIRPIA
Nuvarvik
Talun
Manilla
Kangerdluarbing
Kanjan
Qbbik
Silaq
Itiviuq
Nudlak
Aulitivik
Negdjorung
IV
1 Tarrionitung
2 Inuysugdjuin
3 Saunirtuqdjuaq
4 Tininiqdjuaq
5 Exaluin
6 Audnerbinguausirn
7 Kangerlukdjuausirn
8 Sarbaqdjukulu
d Admiralty Inlet
yon Inlet
nd King William Land
68° Longitude West 67° from Greenwich 66° 65°
Julius Bien & Co. Lith.

C.Brougton
Qeqertuqdjuaq
Ijeqdjuaq
Qoqurbing
Qeqertalukdjuaq
Tulukan
Qingmiqdjuling
Qaxodluin
C.Searle
Qaxodloaping
Aggidjen
(Durban I.)
Padloping
Manitung
Qeqertalukdjuaq
Qujaun
Naujan
Itidlirn
Piqurtung
Simiutang
Ikaroling
Tessiqdjuaq
Qeqerteling
Qairsuq
Kangertloaping
Agpan
Okan
EXETER
SOUND
Qaxodluin
Idjuk
Naujaralung
Angijaralung
Akugdlerpang
Navuktirpang
Qeqertuqdjuaq
Qeqertalukdjuaq
Naussan
Aktinaping
Tessialukdjuak
Tessiq tudlirn
Muingmang
Tappitaridjen
Qaxodlutang
(Qaxodluin)
Coburg Island
PADDLE
Kangertloapiring
Padloping
Kangertloaping
Kangertlugssuaq
Pangnirtung
Pangnirtung
Fiord
Tessialukdjuak
Qeqertalukdjuaq
Qairpoliklung
Qoalukdjuaq
Tessialukdjuak
Tessiq tudlirn
Muingmang
Tappitaridjen
Qaxodlutang
(Qaxodluin)
Coburg Island
1 Tulukan
1 Itidliaping
2 Tikerelling
3 Qognung
4 Qeqertaqadleng
5 Operdniving
6 Ukadlinerbing
7 Avaudjelling
8 Qeqertaujang
9 Tessiujang
10 Ijiksune
11 Kiglusartaibing
12 Imirglortung
67°
66°
65°
64°
63°
62°
61°

I Oqo and Akudnirn

II Frobisher Bay

III Eclipse Sound and Admiralty Inlet

IV Repulse Bay and Lyon Inlet

V Boothia Isthmus and King William Land

Penny
Plateau
QIKIQTARJUAQ
BAFFIN ISLAND
Cape Broughton
Qeqertuqdjuaq
Qeqertalukdjuaq
Qeqertalukdjuaq Qujaun
Padlei
Padlopinga
Manituling
Simiutang
Tessiqdjuaq
Qeqerteling
Pituulang
Qairsuq
Kangerlukdjuaq
Kangerloaping
Nettling Fjord
Qeqertalung
Nuvujalung
Nuvujen
Qeqertalukdjuaq
Numerous Islands
Imigen
Tessiuyavodlang
Qarssuit
Qingujalung
Ikerqo
Segdjuqan
Umanaqmaq
Inukanaqdjung
(Qeqertalung)
Qayodlutang
Qayodlhuin
Naussan
Aktinaping
Tessialukdjuak
Naolinerbing
Tapputardjen
Aggiridjen
Nuvukdjuaq
Nuvukdjuaraqdjuak
Qadla
Aqserriortung
Aqtigiartung
Miliqdjuaq
Qingmiqdjuling
Tulukan
Niaqongnang
Qeqertaq
Naujan
Akuliayaling
Avaliqong
Ikaroling
Qitulle
Ukiuqdjuaq
Qeqertuqdjuaq
Qarsaq
Igijjuq
Tornait
Kingnait II.
Browns II.
Sesseraling
Umanaqs
Avaudjelling
Qingaqdjuaq
Tupirbikdjuin
Porussiara
Porussirn
Qordlubing
Aulitiving
Qaquirbing
Nordlirn
Ussualung
Augpalugtung
Sednirun
Kudling
Atdlinirn
Alikun
Irmadlin
Angiuqaq
Naivaun
Iktortung
Qingaqdjuaq
Tessiqavodlang
Audnerbing
Pujetung
Ikeraqdjung
Qingaseareang
Tessiuyavodlang
Qeqertalung
Nettling Fjord
Qarssuit
Ikerqo
Igping
Qeqertalukdjuaq
Nuvujalung
Nuvujen
Majoriariaqtudlirn
Qairsuahung
Segdjuqan
Umanaqmaq
Inukanaqdjung
(Qeqertalung)
Qayodlhuin
Kiagtung
Pituladjung
Udlainjang
Qaluraraling
Ingnaitarbung
Jeqdjuaraqdjung
Kangertung
Exaluin
Irseling
Qeqertelung
Kautaq
Tupain
Tunukken
Aqbirsiarbing
Angiuq
Akugdlirug
Qeqertelung
Sagdlirn
Taliruq
Iksiarbing
Netternalung
Qatingujang
Ujarasugdjuling
Aningelung
Qaningehausirn
Qadlindjen
Suluaun
Exaluaqdjuin
Kangerlukdjuaq
Komkaujang
Qagnaung
Qeqertaq
Naussaq
Itidlirn
Nappissariag
Tessialukdjuak
Qaluk
Qaluk
Qaluk

THE

MISCELLANEOUS DOCUMENTS

OF THE

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FOR THE

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1887-'88.

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OF THE

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TO THE

SECRETARY OF THE SMITHSONIAN INSTITUTION

1884-'85

BY

J. W. POWELL
DIRECTOR

WASHINGTON
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1888

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LETTER OF TRANSMITTAL.

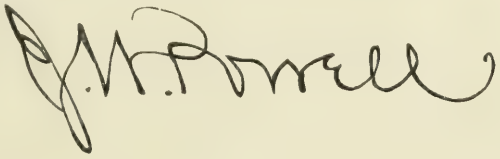
SMITHSONIAN INSTITUTION, BUREAU OF ETHNOLOGY,
Washington, D. C., October 23, 1885.

SIR: I have the honor to submit my Sixth Annual Report as Director of the Bureau of Ethnology.

The first part consists of an explanation of the plan and operations of the Bureau; the second part consists of a series of papers on anthropologic subjects, mainly prepared by my assistants to illustrate the methods and results of the work of the Bureau.

I desire to express my thanks for your earnest support and your wise counsel relating to the work under my charge.

I am, with respect, your obedient servant,



Prof. SPENCER F. BAIRD,
Secretary Smithsonian Institution.

SIXTH ANNUAL REPORT

OF THE

BUREAU OF ETHNOLOGY.

By J. W. Powell, Director.

INTRODUCTION.

The prosecution of research among the North American Indians, as directed by act of Congress, was continued during the fiscal year 1884–'85.

No change has been made in the general plan upon which the work has been prosecuted as set forth in former reports. Certain lines of investigation have been decided upon, which are confided to persons trained in their pursuit, and the results of these labors are presented from time to time in the publications of the Bureau provided for by law. A brief statement of the work upon which each of the special students was actively engaged during the fiscal year is furnished below; this, however, does not embrace all the studies undertaken or services rendered by them, since particular lines of research have been suspended in this, as in former years, in order to prosecute temporarily work regarded as of paramount importance. From this cause delays have been occasioned in the completion of several treatises and monographs, already partly in type, which otherwise would have been published.

Invitation is renewed for the assistance of explorers, writers, and students who are not and may not desire to be officially connected with the Bureau. Their contributions, whether in

the shape of suggestions or of extended communications, will be gratefully acknowledged, and, if published either in the series of reports or in monographs or bulletins, as the liberality of Congress may in future allow, will always receive proper credit.

The items now reported upon are presented in three principal divisions. The first relates to the publication made; the second, to the work prosecuted in the field; and the third, to the office work, which largely consists of the preparation for publication of the results of field work, with the corrections and additions obtained from the literature of the subjects and by correspondence.

PUBLICATION.

The only publication actually issued during the year was entitled Proof-Sheets of a Bibliography of the Languages of the North American Indians, by James Constantine Pilling. The volume, a quarto of 1,175 pages, consists of an author catalogue of books, manuscripts, magazine and newspaper articles, publications of learned societies, and other documents relating in any way to the Indian languages of North America. Only one hundred copies were printed, which were distributed to collaborators.

This work was commenced by Mr. Pilling in 1879 and has been prosecuted with diligence and skill, notwithstanding the engrossing nature of his other duties. It began as an author card catalogue, designed merely for office use. In time it became apparent that such a systematic catalogue of the literature of Indian languages, if printed and distributed, would be of important service to all the numerous workers on the general subject, besides those directly connected with the Bureau, to whom alone it was accessible in manuscript form. By this course the accumulated results of several years' labor would be immediately available for the use of students generally, and the distribution of proof-sheets would in turn increase interest in the work, elicit comment and criticism, and secure additional contributions, through all of which the final volume contemplated would become more satisfactory and

complete, both in form and substance. The thorough conscientiousness and punctilious care shown in the present catalogue, and especially the comprehensive bibliographic spirit in which the work has been conceived, prove the peculiar fitness of the author for the undertaking. He has set before him and has kept steadily in view the following aims:

First, to discover every document in existence relating to the subject, either printed or in manuscript.

Secondly, to record a description of every document found, so accurate and full that each book or article mentioned is clearly identified and all its contents relating to Indian languages set forth, with citation of the chapters and pages within the work where the linguistic material may be found.

Thirdly, to name, when possible, one or more libraries where each work catalogued may be found.

Fourthly, to arrange and combine the whole so that the student using it may in the shortest time learn whether any work contains the special matter which he desires to consult, and, if so, precisely where he may find it. In the case of rare books or papers special attention has been paid to obtain full information, and in the case of some of the rarest books fac-similes of the title pages are given. The value of a work so broadly conceived and so carefully executed is very great. The literature of this subject has become so voluminous, so disconnected, so scattered in time and place, that progress in the classification of Indian languages and the determination of their affinities has been greatly retarded, awaiting the orderly arrangement of accumulated information. This requisite, with the important addition of the correction of current errors, is met by the catalogue. It has been found indispensable to the Bureau and has already been gratefully acknowledged as invaluable by all students of American tribes to whom copies have been distributed.

Since the printing and distribution of the proof-sheets, and markedly as a result thereof, the card catalogue has continued to grow; and, although not complete and, from the nature of the subject, not expected to become absolutely exhaustive, the recent additions to it indicate how thoroughly the work was

originally done. It may be possible, therefore, before long to substitute for the Proof-Sheets the Bibliography itself in standard form.

FIELD WORK.

Under this heading are comprised —

First, the systematic operations of the division of mound exploration carried on east of the Rocky Mountains.

Secondly, researches in and collections from the ancient ruins of the Southwest and comparative study of the present inhabitants of that region and the objects found among them.

Thirdly, linguistic work or expeditions among the several Indian tribes at their homes, with the main purpose of acquiring knowledge of their spoken languages.

Fourthly, general studies, or those embracing various branches of inquiry, conducted among the existing Indian tribes.

MOUND EXPLORATIONS.

WORK OF PROF. CYRUS THOMAS.

The work of exploring the mounds and other ancient monuments of that portion of the United States east of the Rocky Mountains, commenced in 1882, was carried on during the fiscal year, under the charge of Prof. Cyrus Thomas

The regular assistants during the first half of the year were Messrs. P. W. Norris, James D. Middleton, and John P. Rogan For the latter half they were Messrs. Middleton, Rogan, and John W. Emmert, the last named having been engaged to fill the vacancy occasioned by the death of Mr. Norris.

Mr. Norris was engaged during the fall of 1884 in exploring the extensive group of works in the vicinity of Charleston, Kanawha Valley, W. Va. He continued at work there until December, when he was compelled by cold weather and illness to desist. To the great regret of all his associates in the work, his illness terminated in death on the 14th of January, 1885. By his death the division has lost a faithful and enthusiastic worker.

During the summer and fall of 1884 and until the approach of extremely cold weather, Mr. Middleton was engaged in exploring the works of Knox County, Ohio. Throughout the winter and following spring his field of operations was eastern Arkansas. In the latter field he was assisted by Mr. L. H. Thing, who was employed for three months as temporary assistant.

During the summer and until the beginning of winter, Mr. Rogan was engaged (in conjunction with Rev. J. P. Maclean, who was employed as a temporary assistant) in exploring the ancient monuments of Butler County and the adjacent regions of southern Ohio. On the approach of the cold season he went south, his field of operations for the remainder of the year being northern Georgia and the southern counties of East Tennessee.

Mr. Emmert, who had been employed on January 1, 1885, to make some special explorations in East Tennessee, was made permanent assistant immediately after the death of Mr. Norris. His work in that section proving successful he continued it until the close of the fiscal year.

Mr. Gerard Fowke was engaged during November in examining the ancient quarries of Flint Ridge, Ohio, and in making a collection to illustrate the various stages in the aboriginal manufacture of flint implements. His collection is, perhaps, the most complete in this particular line of any so far made in this country. In the winter he was employed about two months in special investigations of some ancient works in Pontotoc and Union Counties, Miss, a locality supposed to have been visited by De Soto during his unfortunate expedition. In some of the mounds of this section, which was formerly the home of the Chikasa, he found some articles of European manufacture, among them a small silver plate bearing the royal arms of Castile and Leon in an old heraldic form.

Although the number of specimens obtained does not exceed that of the collection of the preceding year, the general result shows a decided advance in the accuracy of the work done. The measurements and plats have been made with more care and exactness, the descriptions are more complete, and the de-

tails more fully set forth. As an illustration one case is presented. A large mound was opened which was found to contain over ninety skeletons, irregularly placed and at different depths. At the outset a plat of the mound was made; each skeleton was located on it as discovered, and notes were taken of the depth, position, articles found with it, etc. Thus the exact position of each skeleton in the mound is recorded, as well as that of any article accompanying it The collections made are more varied in character than those of any previous year, including several new types of pottery, some unusually fine stone implements, and from several mounds articles showing contact with Europeans. The pottery obtained by Messrs. Middleton and Thing in Arkansas is of more than ordinary interest, containing a number of specimens of the rarer forms, also several colored specimens.

The same care has been taken as heretofore in labeling and numbering the specimens, so that each can be traced by the record to the exact place where it was found. The illustrations showing the construction, character, and form of the various works explored exceed in number, accuracy, and importance those of any previous year.

EXPLORATIONS IN THE SOUTHWEST.

WORK OF MR. JAMES STEVENSON.

Mr. James Stevenson was placed in charge of a party, with instructions to proceed to Arizona and New Mexico to make researches and collections among the Pueblo Indians and the ancient ruins in that region.

Mr. Stevenson's party was divided into three sections. The section in charge of Mr. F. T. Bickford visited the remarkable series of ruins in Chaco cañon, in northwestern New Mexico; Cañon de Chelly and its branch cañons; the cliff dwellings in Walnut cañon, in Arizona, and a group of interesting cave dwellings, different in structure from any heretofore found, near Flagstaff, in the same Territory. All these were carefully examined. Full and extensive notes, as well as sketches and photographic illustrations, were made of these ruins.

Another section, in charge of Mr. C. A. Garlick, was stationed at the pueblo of Acoma, in New Mexico. The work at this village resulted in a collection of about thirty-five hundred specimens, consisting of pottery and a variety of utensils of other material, such as stone, bone, wood, and woven fabrics, illustrating the arts of the people of Acoma. The collections from this pueblo, though not embracing a great variety of objects, will illustrate nearly all the phases of the arts and industrial pursuits of these Indians.

Another section of Mr. Stevenson's party, under his own supervision and with the important assistance of Mrs. Stevenson, was employed in making collections and studies at Zuñi. The collection from there is much larger than any heretofore obtained and includes many objects relating to the outdoor ceremonies of the Zuñi. Specimens of these were secured from their sacred springs, caves, and shrines. All details relating to their ceremonials were attentively studied, and a series of water color sketches was made of altars used and of masks worn on these important occasions. A large number of fetiches was also obtained, representing many of the animals held in religious esteem by the Zuñi. A series of photographs was made of the sacred springs, wells, monuments, picture writings, and shrines of the Zuñi located at different points over an area of about seventy-five miles from Zuñi, and a collection was secured of representative specimens of their fetiches, plume sticks, and other objects connected with their mythology and religious practices. The collection made during the year was unusually large and important. It comprises about eighty-five hundred specimens from the Indian tribes of the Southwest embraced in the research; these consist of woven fabrics and pottery, bone, and stone implements, both ancient and modern, and represent nearly all phases of the life, art, and industries of these tribes. These collections have been deposited in the U. S. National Museum for arrangement, classification, and description.

WORK OF MR. VICTOR MINDELEFF.

A party in charge of Mr. Victor Mindeleff left Washington on August 5 to survey the ruined pueblos of the Chaco, in New

Mexico. Five of the ruins were accurately measured and platted to scale, and a full series of sketches, plans, and photographs was secured. Mr. Mindeleff returned from the field on the 1st of October. He then made a trip to the great Etowah mound, near Cartersville, Ga., under the direction of Prof. Cyrus Thomas, in order to secure an accurate survey and scale drawing, as a basis for the construction of a model.

At the close of this work Mr. Mindeleff returned to Washington, on October 7, and was engaged in office work until the middle of the following June, when he took the field in advance of his party for further studies among the ruins and pueblos of the Cibola and Tusayan groups. He was also instructed to secure similar material at other available points for comparison.

LINGUISTIC FIELD WORK.

WORK OF MRS. ERMINNIE A. SMITH.

From the 1st of July to the 15th of August, 1884, Mrs. Smith, assisted by Mr. J. N. B. Hewitt, of Tuscarora descent, was engaged among the Onondaga living near Syracuse, N. Y., in translating and annotating two Onondaga manuscripts; afterward, until the latter part of October, with the same assistance, she was at work on the Grand River reservation in Canada, where she filled out the vocabulary in the Introduction to the Study of Indian Languages from the dialect of the Cayuga. She also obtained from the Mohawk a translation, with annotations, of a manuscript in their dialect.

The three manuscripts mentioned are now in the possession of the Bureau of Ethnology. Their origin and history are not distinctly known, as they are all probably copies of originals which seem to have been lost or destroyed. It was intended in these manuscripts to reproduce, by the alphabet and the script used by English writers, the sound of the dialects employed.

These records have their chief interest in the preservation of many archaic words, or those of ceremony, law, and custom, which in these dialects, as is the general rule, remain unchanged, although the colloquial language may be modified.

The subject matter of all these records is genuinely and exclusively Iroquoian.

The Mohawk manuscript was copied about the year 1830 by Chief John "Smoke" Johnson from an earlier original or perhaps copy. The orthography of this copy is quite regular and is that of the early English missionaries, being similar in many respects to the well known Pickering alphabet.

One of the Onondaga manuscripts was found in the possession of Mr. Daniel La Fort and the other in that of Mrs. John A. Jones, both of the Onondaga reserve, New York. These two copies differ from each other in orthography and substance, the Jones manuscript being probably a full detail of a part of the other.

The orthography of the La Fort manuscript is very irregular and difficult to read, but that of the Jones manuscript is regular and legible. The Mohawk manuscript contains a detailed account of the rites and ceremonies, speeches and songs, of the condoling and inducting council of the Iroquoian League in the form in which that council was conducted by the elder brothers or members of the Onondaga, Mohawk, and Seneca divisions, which have been generally called tribes, but are more correctly confederacies, their villages being the tribal unit. The La Fort Onondaga manuscript comprises a similar ritual of the same council as carried out by the younger brothers, viz, the Cayuga, Oneida, and Tuscarora members or confederacies of the league. The Jones Onondaga manuscript is the charge of the principal shaman to the newly elected or inducted chief or chiefs.

During the remainder of the year material was collected and work continued on the Tuscarora-English part of the Tuscarora dictionary.

WORK OF MR. H. W. HENSHAW.

Mr. H. W. Henshaw visited southern California for the purpose of pursuing linguistic studies in the group of languages spoken by the Santa Barbara Indians. Although these Indians became known at a very early day, being mentioned with particularity in the relation of Cabrillo's voyage along

the California coast in 1542, but little has been ascertained in respect to their language and its relations to the speech of neighboring tribes.

Few vocabularies were collected by the early Spanish missionaries and those gathered were very imperfect, so that no conclusions can be based upon them with confidence.

As a result of the policy pursued by the various missionaries among these docile tribes, aboriginal habits were soon exchanged for others imposed by the priests. Tribal organizations were broken up and the Indians were removed from their homes and located about the missions. In addition the Spanish language was early introduced and so far as possible made to replace the aboriginal tongue. As a consequence Spanish became familiar to a large number of the proselytes, and all the surviving Santa Barbara Indians speak Spanish fluently, or rather the Mexican dialect of Spanish. Indeed, the impression prevails generally in California that none of the Indians can speak their own tongue. As a matter of fact, however, in their own families and when away from the white men they discard Spanish entirely.

The attempt to preserve the language was begun none too soon, as of the large population attributed to this part of the California coast Mr. Henshaw was able to discover only about fifty survivors, and these were widely scattered over several counties. A number of the dialects of the linguistic family are now extinct, and only a month before Mr. Henshaw's arrival at San Buenaventura an old woman died who, it is believed, was the last person to speak the dialect belonging to the Island of Santa Cruz. In Santa Barbara and Ventura counties six dialects of the family were found, which are believed to be all that are now extant.

In the case of the dialect of Santa Rosa island, but one Indian remained to speak it. Two more dialects are spoken by two or three individuals only. The existing dialects, named according to the missions around which they were spoken, are as follows: San Buenaventura, Santa Barbara, Santa Rosa Island, Purissima, Santa Inez, and San Luis Obispo. With the exception of the last named the several dialects are very closely

related, and, although each possesses a greater or less number of words not contained in the others, their vocabularies show many words which are common to all.

The dialect formerly spoken at San Luis Obispo differs much from any of the others, and a critical comparison is necessary to reveal a sufficient number of words possessing identical roots to render their common parentage obvious.

Extensive vocabularies of the dialects of San Antonio and San Miguel were obtained, there being about a dozen Indians who speak these languages around the old San Antonio mission. These languages have been supposed to be of the Santa Barbara family (as it has hitherto been termed, now called Chumashan family), but the material obtained by Mr. Henshaw disproves this, and, for the present at least, they are considered to form a distinct family.

Mr. Henshaw visited Los Angeles and San Diego counties for the purpose of determining the exact northern and southern limits of the Shoshonian family, which extends quite to the coast in California.

At San Diego and San Luis Rey he obtained vocabularies representing four dialects of the Yuman family.

WORK OF MR. A. S. GATSCHET.

In August, 1884, Mr. Gatschet proceeded to visit the Tonkawē and Lipan tribes in Texas

He reached Fort Griffin on the 29th of August. The Tonkawē tribe was encamped about a mile and a half south of Fort Griffin, Shackleford county, and consisted of 78 individuals, while the Lipan camp, one mile north-northwest, consisted of 19 persons only. All these Indians were on the point of removing to the Oakland reserve, Indian Territory.

The Tonkawē constitute an aggregate of several tribal remnants formerly living independently of one another in southern Texas and on the Rio Grande. Mr. Gatschet devoted five weeks to the study of their language and one week to that of the Lipan, which is a dialect of Apache (Athapascan).

The Tonkawē is a sonorous and energetic form of speech. The radix of many of the adjectives becomes reduplicated to form a kind of plural, and the same thing is observed in some of the verbs, where iteration or frequency has to be indicated. Case suffixes are observed in the substantive, which can easily be traced to postpositions as their original forms. Very few of the natives were sufficiently conversant with English or Spanish to serve as interpreters, so that it was difficult to secure trustworthy results. A white man who had lived over six years among them was of material help, and several mythologic and other texts were obtained with tolerable correctness through his aid.

On October 9 Mr. Gatschet left Fort Griffin and reached Fort Sill, in the Indian Territory, on the 15th. Many Kaiowē and Comanche Indians encamped during the warmer months of the year around this fort, which is situated at the southeast base of the Wichita mountains. He engaged the best help he could find for studying the Kaiowe language, for which there is no Government interpreter. The Comanche is the predominating language on the whole Kaiowē, Comanche, and Apache reservation, although the Comanche exceed the Kaiowē but little in number. The Comanche is more easily acquired, at least to the extent required in conversation, and all the traders and shopkeepers on the reservation have a smattering of it.

Better interpreters for Kaiowē were obtained at Anadarko, the seat of the agency, where Mr. Gatschet remained from October 31 to December 12. A few Kaiowē were found who had passed some months or years among Americans or at the Indian schools at Carlisle, Chilocco, and elsewhere, and could express themselves intelligibly in English. A few white Mexicans were found among the Comanche, who were captured by them in infancy, acquired the Comanche language, and have ever since lived among these Indians. Of the Kaiowē, Mr. Gatschet acquired over two thousand terms, phrases, and sentences, several historic texts of value, and of the Comanche, eight hundred or a thousand words. The circumstances necessitated careful and numerous revisions of everything obtained, by which much of the time was absorbed.

The Na-ishi Apache, about four hundred in number and formerly roaming with the Kaiowē, furnished also a large amount of terms, exceeding fifteen hundred.

There are a few verbal similarities between the Kaiowē and the Shoshoni languages, but apparently not enough to indicate anything more than long association of these peoples. The Kaiowē has a dual in the intransitive verb and in some nouns. There are more than a dozen different modes of forming the plural of nouns. The subject pronoun is incorporated with the verb as a prefix, and every tense has a different subject pronoun, as in Otomi and other languages of southern Mexico.

Vocabularies were also obtained of Delaware, Ottawa, Yuchi, Caddo, Wichita, and of the hitherto unstudied Caddo dialects of Anadarko and Yatassi.

In spite of persevering search it was not possible to find any of the Bidai or the Tonica in Texas, although it is probable that some of them survived in that State as late as 1850.

Mr. Gatschet then passed a whole month among the Atakapa at Lake Charles, the county seat of Calcasieu parish, Louisiana. Of the two dialects traceable, only the western one seems to exist now, being still spoken by a few women living at the town. The language is sonorous, but strongly nasal.

Returning to the Indian Territory, after a fruitless search for the Tonica and Adai, he stopped at Eufaula, Creek Nation, to meet a Na'htchi Indian named Lasley, about sixty years old, who had represented his tribe in the councils of the Creek Nation. This man explained his Na'htchi terms and phrases by Creek equivalents, and these had to be translated into English to obtain full light concerning the Na'htchi terms. One legendary text was also obtained. The language is rather consonantal and has a multiplicity of verbal forms.

Among the Yuchi tribe on Middle Arkansas river, southwestern bank, and over 40 miles from Muscogee Station, Indian Territory, he remained but a week, too short a time to obtain full information respecting this interesting language. There are five or six hundred Yuchi still living on this tract. Two texts and a few popular songs, with one thousand terms of the language, were obtained.

The last stop was made among the Modoc at Quapaw Agency, at the agency buildings. About ninety are left of those brought there for having taken part in the Modoc war of 1872–'73. Five mythic tales were gathered from the natives within the short time of three weeks, one of them being of considerable length and of importance. It is called "The birth of Aishish." The birth of this astral deity resembles in most particulars that of Bacchus from the thigh of Jupiter after his mother, Semele, had been burned to death. The terms, phrases, and sentences gathered, besides the myth mentioned, amount to over fifteen hundred items, which will prove useful for completing the work on the Klamath Indians of Oregon now in preparation.

Of the Shawnee language several hundred words were gathered from the Indians of that tribe settled around the agency.

Mr. Gatschet returned to Washington in April, 1885.

WORK OF REV. J. OWEN DORSEY.

Rev. J. Owen Dorsey visited the Siletz Agency, Oregon, in August, 1884, to gain linguistic and other information respecting the tribes in that region. When he returned, in November, he brought back as the result of his work the following vocabularies:—Athapascan family: Applegate Creek, Galice Creek, Chastā Costa, Miko-no-tunne, Chetco, Smith River, Cal., and Upper Coquille.—Yakonan family: Yaquina, Alsea, Siuslaw, and Lower Umpqua.—Kusan family: Mulluk or Lower Coquille.—Takilman family: Takilma or Upper Rogue River.—Shahaptian family: Klikitat.—Sastean family: Shasti—total, nineteen vocabularies, ranging from fifty to three thousand entries, exclusive of phrases and grammatical notes.

He also obtained materials for an account of the social organization into villages of some of these Indians, the basis for which appears to have been the clan or gens. Rough maps, showing the localities of the villages, were made. Mr. Dorsey also obtained from several tribes the corresponding Indian names of about sixty vegetal products, specimens of which were brought to Washington for identification.

WORK OF MR. JEREMIAH CURTIN.

Mr. Curtin spent the first two weeks of July at the Quapaw agency, Indian Territory, in making a collection of Modoc myths, which he had begun in the preceding winter, being part of a general collection of Indian myths begun in 1883. The number of Modoc myths obtained was nearly one hundred.

After finishing work at the Quapaw Agency, he returned to Washington, and shortly afterward was directed to proceed to northern California and obtain vocabularies of the Nosa and Kombo languages, and thence to Oregon to obtain vocabularies of the Wasco, Tyigh, and Tenina languages.

Work was begun on the Nosa language (Yanan family) at Redding, Cal., on October 11. The difficulties were very great, especially at first, owing to the fact that the Nosa are few in number, live far from one another, and have a very imperfect knowledge of English.

The Nosa were a prominent and rather numerous people until 1864, when all of them who could be found were massacred by white settlers, who organized two companies for the purpose of exterminating the tribe. Owing to a chance by which a few escaped and to the exertions of Mr. Benjamin Oliver, who secreted several in his cellar, about fifteen full blood Nosa survived.

Work on Nosa was continued in and around Redding until the end of November, when Round Mountain was visited to complete the Nosa vocabulary and obtain that of the Atsugei (Palaikan family), a very interesting language. Work at Round Mountain was finished on January 8 and Redding was revisited on January 9, preparatory to departing for Oregon.

Owing to the excessive severity of the winter and the snow blockades, which lasted six weeks, communication with Warm spring was closed, and it was impossible to enter the reservation till January 27, when Sinnashee, a school and center of the Warm Spring Indian population, was reached.

At this place the Tyigh vocabulary (Shahaptian family) was collected. The Wasco (Chinookan family) was obtained at the agency headquarters near the Deschutes river. Tenina,

being identical with the Tyigh language, was omitted. From April 18, at which date work at the Warm Spring agency was finished, until June 30, the time was devoted to collecting myths in the Klamath reservation and at Yreka.

During the whole period of work all the myths that could be found among the people whose languages were being investigated were reduced to writing. In this manner a large body of Nosa, Atsugei, Tyigh, and Wasco myths was collected. In the cases of Klamath and Shasti, myths were the objects directly in view

The vocabularies were obtained with satisfactory completeness and the verbal systems worked out in detail.

The Nosa is remarkable for a regularity of structure which yields to analysis and has a certain monotonous harmony of sound.

The Atsugei has a sonorous roll, a strong letter *r*, and a certain number of words in common with the Shasti, itself one of the *r* languages.

GENERAL FIELD WORK.

WORK OF DR. WASHINGTON MATTHEWS.

Dr. Washington Matthews, assistant surgeon U. S. Army, continued his investigations among the Navajo Indians in New Mexico and Arizona. He had been stationed in the Navajo country as post surgeon of Fort Wingate, N. Mex., from 1880 to 1884, during which time he devoted himself to studying the language, customs, and ceremonies of this tribe as much as his official duties would permit. Some of the great shamanistic ceremonies of the Navajo, occupying nine days for their performance, he had often seen in part; but he had never had an opportunity of witnessing one throughout its entire duration, as he had not sufficient time at his disposal.

Before leaving New Mexico, however, he secured the friendship and confidence of some of the leading medicine men and obtained their promise to admit him to their most secret rites during their entire performance whenever he should be able to avail himself of the privilege. He was also promised com-

plete instruction in the mythology and symbolism of these rites.

In the autumn of 1884 he was given an opportunity, under the auspices of the Bureau of Ethnology, to return to the Navajo country and devote himself for a considerable time entirely to anthropologic studies among the people.

He first visited the Navajo who dwell in the neighborhood of the San Mateo mountains, the Tsotsildinè, or people of the Great Peak, a local division or subtribe living much farther to the east and having longer and more intimate associations with Mexicans and Americans than the main body of the people. While at this place he ascended the peak of San Mateo, or Mount Taylor, a mountain held sacred by the Navajo, to observe the various places on the mountain mentioned in the Navajo myths

Leaving San Mateo he proceeded to Fort Wingate, and learning that one of the most important of the Navajo rites was about to be celebrated at a place called Niqotlizi (Hard Earth), north of Fort Wingate on the Navajo reservation, he repaired thither without delay. The ceremony which he went to witness was that of dsilyídje-qaçàl, or mountain chant. It is also called Ilnasjingo-qaçàl, or chant in the dark circle of branches, from the great corral of evergreens in which the public rites of the last night are performed. It is known to the white men who live among these Indians as the hoshkawn dance, from one of the public dances of the last night, in which the Indian jugglers pretend to grow and develop the hackàn, or *Yucca baccata*. This last night's performance is varied and interesting and all persons, including whites and Indians of other tribes, are permitted to witness it; but previously, for several days, mystic rites are celebrated in the medicine lodge, to the most of which only the initiated are admitted. Dr. Matthews remained ten days in the Indian camp at Niqotlizi, during which time the shamans admitted him into their medicine lodge and allowed him to observe their rites and practices.

His most interesting discovery on this occasion was that of their system of mythic dry paintings, by which they represent

various legends or traditions with dry pigments on the sanded floor of the medicine lodge. A full account of the ceremonies and of the myth on which they are based was prepared by Dr. Matthews and appeared in the Fifth Annual Report of this Bureau.

When the ceremony at Niqotlizi was over he proceeded to a locality in Arizona called by the whites The Haystacks, from the peculiar appearance of the rock formations there. At The Haystacks another great ceremony, probably the second in importance of the Navajo rites, was to take place. Here he again encamped with the Indians and remained until the work of the shamans was done.

The ceremonial observances witnessed on this occasion are, collectively, called by the Navajo Klèdji-qaçàl, or chant of the night. They are called by the whites the Yàybichy dance, from the name of the principal masked character, Yèbitcai or Gebitcai, the granduncle of the gods. Like the hoshkawn dance, it has several days of secret rites with elaborate symbolic sand pictures and one night of public dances, less varied and interesting than those of the hoshkawn. Dr. Matthews was permitted to witness the whole performance and to take as many notes and sketches as were necessary.

From The Haystacks Dr. Matthews went to the Indian agency at Fort Defiance, Arizona, where he secured the services of one of the oldest and most learned (in their own peculiar lore) of the Navajo priests, and from him he obtained full explanations of all these rites and of the symbolism of the pictures and masked characters, with a complete recital of the long and elaborate myths on which the ceremonies depend, and the texts and translations of the very numerous songs which form the ritual of the ceremonies.

WORK OF DR. H. C. YARROW.

Dr. H. C. Yarrow, acting assistant surgeon U. S. Army, with the assistance of military details and supplies, in addition to the instruction and facilities provided by this Bureau, started, August 8, 1884, on an expedition into the Territory of

Utah, with reference mainly to the exploration of burial mounds and the study of mortuary customs

Near Choke Cherry Spring a burial cave was discovered, containing the skeletons of three persons, which were secured. Other skeletons, with contents of graves, were obtained near Willow creek; also, an interesting specimen of tree burial.

At Deep creek an explanation of the curious form of water burial was gained from a chief of the Gosiats, to the effect that the bodies of the turbulent and disorderly men of the tribe were thus disposed of to prevent the spirits of these objectionable persons from joining the rest of the tribe after death. Their bodies were sunk in springs and marshy places and kept down by sticks and stones, so that their spirits could never get out.

In the neighborhood of Fillmore a mound was excavated which afforded an admirable example of the beforementioned conversion of a dwelling into a sepulcher. The probability is that the deceased died in his house, which was made of adobe bricks, and that it was at once abandoned and the body left therein, the roof being first removed. The corpse was placed on the floor and covered with a paste of moist clay, on which were placed the mortuary gifts of weapons, utensils, and food. Cottonwood branches were then piled above and set on fire, thus baking the clay crust and charring the several objects. The whole structure had been covered, so that on first examination the hard surface of burnt clay, 18 inches below the loose earth, appeared to be the floor of a former dwelling.

In the whole of the expedition, which continued into the last days of September, much difficulty was experienced from the suspicion and consequent hostility of the Indians of the localities visited.

WORK OF DR. W. J. HOFFMAN.

Dr. W. J. Hoffman proceeded early in August to Victoria, B. C., where numerous sketches of Haida totem posts and carvings were obtained, in connection with the myths which they illustrated. At this locality attention was paid to the

burial customs and osteologic remains of the nearly extinct tribe of Songish Indians.

At Port Townsend sketches were obtained of Thlinkit ivory and wood carvings, clearly indicating the adoption by that tribe of Haida art designs. Here, too, many Indians of British American tribes were met on their way south to work in the Puyallup hop fields, notable among which was a large number of Haida, whose persons were examined for the purpose of copying the numerous and varied tattoo designs with which they were profusely decorated. Interpretations of many of these characters were obtained from the persons bearing them, as well as from the chief artist of the tribe, together with concise descriptions of the methods and customs in connection with tattooing and the materials used. Drawings were made of a collection of Eskimo pictographs and ivory carvings at the museum of the Alaska Commercial Company and the California Academy of Sciences, San Francisco, Cal.

At Santa Barbara, Cal., Dr. Hoffman discovered some painted pictographs and examined a number which have not yet been published. In several private collections at this place were found interesting relics of the Indians formerly inhabiting Santa Cruz island, the most important of which was a steatite cup containing earthy coloring matter and pricking instruments of bone, which had evidently been used in tattooing. Painted pictographs were also visited in the Azuza cañon, twenty-five miles northeast of Los Angeles.

At Tule Indian Agency, in the deep valleys on the western slope of the Sierra Nevada, sketches of pictographs were made in continuation of work accomplished there two years before. Vocabularies were also obtained from the Waitchumni Indians here located, as well as from the few remaining Santa Barbara Indians at Cathedral Oaks, Santa Barbara county, Cal. By far the greatest amount of pictographic material was collected in Owen's valley, California, where series of petroglyphs are scattered over an arid, sandy desert, the extremes of which are more than twenty miles apart.

OFFICE WORK.

The work upon a synonymy of the Indian tribes of North America, which has been mentioned to some extent in former reports, has been continued with increased energy.

Every tribe of Indians of any size and importance has been treated of by historians under a variety of names. The sources of these different appellations are manifold. In very many instances the names of tribes or other bodies of Indians communicated by themselves have been imperfectly understood and erroneously recorded; misspelled names and typographical errors have been perpetuated.

Traders, priests, and colonists have called the same tribes by different names and the historian has often added to the confusion by handing down these synonyms as the names of other and different tribes. Not a few tribes well known under established names have received new names upon a change of residence, especially when they have removed to a great distance or have coalesced or allied with other tribes. Added to these and to other sources of confusion are the loose and dissimilar applications of the terms clan, band, tribe, confederacy, and league, the same term having been used with various meanings by different authors.

As a consequence the student of Indian languages and customs finds himself in a tangle, as regards tribal names, which it is beyond the power of the individual worker, unaided, to unravel. The scope of the work in question includes the attempt to trace the several names back to their sources and to ascertain their original and proper application, to define their meaning when possible, and to relegate each tribe under its proper title to the linguistic family to which it belongs In the completion of this work the whole force of the Bureau assists.

The need of a volume giving the results mentioned has long been felt, and it is believed that it will prove to be one of the most important contributions to the accurate study of Indian history ever made. The classification of the languages of the North American Indians is closely connected with the synon-

ymy of tribal names, each work assisting the other. During recent years the number of students who have directed their attention more or less exclusively to the study of Indian languages has been constantly augmented, and as a result of their labors the number of vocabularies has been correspondingly increased; hence the demand for a more comprehensive and satisfactory classification than now exists.

Prior to Gallatin's time little or nothing had been done in the direction of a systematic classification of Indian languages. In 1836 Gallatin issued his treatise in which he classified all the languages which he was able to study by a direct comparison of vocabularies. His classification was an immense advance over anything previously done and has proved a boon for scholars, having served, indeed, practically as the basis for most of the work in the same line performed since his time. No fixed rules of nomenclature, however, have ever been adopted by linguistic writers, and authors have named and renamed linguistic groups without regard to the names imposed upon the same or similar groups by earlier writers. As a result great confusion has followed not only respecting the status of the various linguistic families, but also respecting the identity of the languages which have served as a basis for the several groups proposed. The remedy for this state of affairs is the adoption, with strict adherence thereto, of a code of nomenclatural rules similar in scope to those prevailing among zoölogists.

There would appear to be no good reason why the rule of priority of name, for instance, should not be followed in linguistic as well as in zoölogic classification, or why the same beneficial result of fixity of nomenclature should not be expected to result from the adoption of this rule in the one case as in the other. Students who may attempt to unravel the many perplexing nomenclatural problems arising from unnecessary change of names will certainly agree that such a rule is no less desirable in linguistics than in zoölogy.

Accordingly, the rule of priority of name, within certain limitations, together with some other rules, has been adopted by the Bureau. These limitations and rules, together with a dis-

cussion of the subject, which would still be premature, may be presented by the Director in his next annual report.

Mr. H. W. Henshaw, when not in the field, was specially engaged in the organization and details of the office work upon tribal synonymy and linguistic classification above described. A careful examination of all the literature pertaining to these correlated subjects was necessary and also the preparation of tentative tables of synonymy. He has prepared such tables and made in connection with them a brief historical résumé of the literature. Much longer time and the work of the whole official force will, however, be needed for the completion for publication of the results of this vast and complicated undertaking.

Mrs. Erminnie A. Smith was occupied, while not engaged in the field as reported above, in the revision for publication of her Tuscarora dictionary, the material for which had been collected during several years.

Col. Garrick Mallery continued the collection and classification of material on the two correlated subjects of sign language and pictographs. His two preliminary papers on those subjects have appeared in former annual reports. It is intended, while increasing the data obtained from the Indian tribes of North America, bearing upon these subjects, to supplement and illustrate the mass of information collected from those tribes by comparison with everything of a similar character to be found in other parts of the world and to publish the results of the collection and study in the form of monographs.

Dr. W. J. Hoffman, when not in the field, continued to assist in the work mentioned.

Mr. James C. Pilling's preparation of the Bibliography of North American Languages continued during the year. In October and November he visited several libraries in Boston and Providence, for the purpose of clearing up a number of doubtful points. During the year pages 839–1135 were received from the printer, which completed the volume. In the spring a limited number of copies were struck off by the Public Printer, and these have been sent to various libraries, public institutions, and to individuals interested in the subject, for

the purpose of obtaining additions and corrections, with the intention, if these should prove to be numerous, of resetting the matter.

Mr. Frank H. Cushing was stationed at Washington at the commencement of the fiscal year and was engaged in the classification of his field material in preparation for its publication. During the fall he completed a short paper on Zuñi culture growth as evidenced by studies of Pueblo ceramics, which was published in the Fourth Annual Report of the Bureau. In this paper he maintains, with a large amount of linguistic evidence, that the Zuñi culture is mainly autochthonous, and that its growth, especially the growth of architectural, agricultural, ceramic, and other arts and industries pertaining to it, has been largely accomplished within the desert areas of America which still form the habitat of the Pueblo Indians, and probably, also, within a period more limited than has usually been supposed essential to such development.

He prepared also a paper on the "Ancient province of Cibola and the seven lost cities," in which he not only identifies the seven cities of Cibola above referred to with seven ruins near the present Zuñi village, but also furnishes interesting examples of the permanence of Indian tradition and of its value, when properly used, as a factor in ethnographic and historic research.

Among the later and perhaps more important results of his studies during the year are investigations of the myths and folk tales abundantly recorded by him during previous years among the Zuñi.

By the extended comparison which he is able to make between these folk tales and myths, now first brought together as a whole, and by the application to their study of the linguistic method employed by him in the preparation of the two papers already mentioned, he is able to trace the growth of mere ideas or of primitive conceptions of natural or biotic phenomena and of physical or animal function into the personæ and incidents which go to make up myths, as well as to trace the influence of these growths on the worship of the Zuñi.

Early in 1885 Mr. Cushing furnished the Director with a schedule of his manuscript, notes, and sketches, and from an examination of this it was deemed advisable that he should continue putting his linguistic material into permanent shape, in order that it might be used as a check on ensuing studies of the sociology and mythology of the Zuñi, as well as for its suggestive value towards the explanation of obscure passages in those departments of study. This work had progressed but little, however, when a severe illness necessitated its temporary abandonment.

Prof. Cyrus Thomas, in addition to his administrative duties in charge of the division of mound exploration, was engaged in preparing for publication the results of the operations of that division. The constant arrangement, comparison, and study of the material objects and facts ascertained required his close application. He also commenced the paper presented by him in this volume.

Mr. Victor Mindeleff, in the first part of the fiscal year, completed models of the seven villages of the ancient Province of Tusayan, together with a relief model illustrating the topographical character of the province. The model of Walpi, of this series, was carried out in such a manner as to show on a large scale the character of the rocky mesa on which the town is built. Several types of cliff ruins were also modeled for this series, among them the White House ruin of Cañon de Chelly and the mummy cave of Cañon de la Muerte. After August 1 this work was carried on under the supervision of Mr. Cosmos Mindeleff, who also prepared a model of the great Etowah mound from the data of Mr. V. Mindeleff's survey; he also furnished several other examples of mounds, with sections, under the direction of Prof. Cyrus Thomas. This work was carried on without interruption until December 7, when Mr. Cosmos Mindeleff was ordered to New Orleans, to take charge of the combined exhibits of the U. S. Geological Survey and the Bureau of Ethnology, and was instructed to look after the proper installation of the same in the Government building. He returned to Washington about February 1. During the ensuing four months the small force in the

modeling room was engaged in making models of the ancient pueblos of the Chaco, from the plans secured during the preceding summer, as referred to in the report of field work. This work continued until early June, when Mr. C. Mindeleff was again ordered to New Orleans to take charge of the packing and shipment of the exhibits of the Geological Survey and Bureau of Ethnology for their return to Washington and for the installation of a portion of the material at the Louisville Exposition. During the interval from February 1 to June 15 Mr. Victor Mindeleff was engaged in the preparation of a report on the architecture of the ancient provinces of Cibola and Tusayan, together with the plans and diagrams necessary for its illustration. This study was based on the large amount of data that had been secured during former field seasons for modeling purposes.

Rev. J. Owen Dorsey, when not in the field, made nearly 10,000 entries for the Ɋegiha-English dictionary, and prepared Ponka and Omaha native texts, with free and interlinear translations, in addition to those found in part 1 of vol. 6, Contributions to North American Ethnology. After December 1, 1884, he collated the following vocabularies obtained by him in Oregon, viz: Takelma, Shasti, Applegate Creek, Chastā Costa, Galice Creek, Mulluk, Siuslaw, Lower Umpqua, Yaquina, Klikitat, and one on Smith River, California. He also prepared a list of the villages obtained from the tribes at the Siletz Agency, Oregon.

Mr. Albert S. Gatschet was engaged at the beginning of the fiscal year in revising and perfecting his grammar of the Klamath language of southern Oregon. The phonology was completed and stereotyped, extending from page 200 to 245. He was engaged in correcting proofs of the subsequent section on morphology when he proceeded to the Southwest, as elsewhere reported, to investigate several languages spoken there, the affinities of which had not before been ascertained.

Mr. W. H. Holmes, as in previous years, has supervised the illustrations of the Bureau publications. He also continued his archæologic studies, chiefly in the department of ceramics, the character of which is shown by his papers in this volume.

He was in charge of the preparation of exhibits for the expositions at New Orleans, Louisville, and Cincinnati; but, owing to the pressure of other duties, much of this work was intrusted to Mr. Cosmos Mindeleff, who was assisted materially by Mr. Victor Mindeleff. The most important feature of the exhibits consisted of models of plaster and papier mâché of the pueblo towns and cliff houses of New Mexico and Arizona.

Aside from the models, exhibits of ethnologic and archæologic materials were made. A large and important collection of objects of pueblo art was obtained by Mr. James Stevenson, but much of it failed to reach Washington in time for exhibition purposes, and a series of similar objects, already classified and labeled, was selected from the National Museum and forwarded to New Orleans. A valuable collection of the ancient fictile products of Tusayan belonging to Mr. Thomas Keam was also utilized in perfecting the exhibits of Pueblo art.

Archæologic materials from other sections of the country were placed on exhibition, notably a superb collection of prehistoric relics from the province of Chiriqui, Panama, which was purchased for the purpose.

The collections of ethnologic and archæologic material made during the year are of unusual importance and magnitude. This is chiefly due to the facilities afforded by the New Orleans Exposition fund, a liberal portion of which was devoted to the collection and purchase of objects of permanent value to the Government and to science. The collections made by Mr. Stevenson in Zuñi and Acoma comprise upward of four thousand pieces, chiefly objects of clay, but including other classes of products. The collection of prehistoric relics obtained by Mr. J. A. McNiel from the tombs of Chiriqui is one of the most important and complete series of ancient American products to be found in any country, and must prove of great value to students.

Mr. Victor Mindeleff secured a small series of relics from the ancient ruins of northern New Mexico and Arizona, and Dr. H. C. Yarrow added some objects of archæologic and ethnologic interest from central Utah. Mrs. Erminnie A. Smith procured a number of articles of shell, illustrating the

modern manufacture of wampum in New Jersey; a small collection of fragmentary pottery from the eastern shore of Maryland was presented by Mr. Joseph D. McGuire, of Ellicott City; and Mr. Holmes secured a series of articles, including arrowheads, shell implements, and pottery, from the island of Nantucket. Mound explorations, conducted by Dr. Cyrus Thomas, yielded a valuable series of objects of stone and clay. An unusually interesting series of the earthen vessels of the ancient pueblo races was secured by Mr. E. W. Nelson in eastern central Arizona. The greater part of the abovementioned material has already been catalogued and turned over to the U. S. National Museum.

Dr. H. C. Yarrow, acting assistant surgeon, U. S. Army, besides his field explorations described, continued to collect information relative to the mortuary customs of North American Indians. Of the material gathered, a considerable portion has been forwarded by various persons throughout the country in answer to the circular sent out early in the last year, but much has also been derived from the published works on anthropologic subjects, including scientific journals and reports. Numerous authorities have been consulted and much time has been devoted to the consideration of the many theories advanced to account for certain peculiar rites and customs.

Mr. Charles C. Royce continued during the year the preparation of a historical atlas of Indian cessions. The boundaries of the various cessions of land by the different Indian tribes were traced out and located upon the maps of the States and Territories left uncompleted at the date of the last annual report. All that remains to be done in completing the atlas for publication is to transcribe, with considerable elaboration, the historical and descriptive notes pertaining to the various cessions, and to make, from the rough working sheets, legible copies of the maps showing the boundaries of the cessions within the States of California, Oregon, Nevada, and Texas and the Territories of Washington, Idaho, Montana, Wyoming, Utah, New Mexico, Arizona, and Dakota. Most of these States and Territories will each require two maps, showing respec-

tively the primary and secondary cessions. The work will be finished as rapidly as possible.

ACCOMPANYING PAPERS.

The present volume contains papers the subject matter of which may be classified under the grand divisions of Technology, Philosophy, Sociology, and Ethnography.

They are all prepared by experts of recognized authority in their several lines of research and are illustrated to the degree required by the text for full understanding, the number of figures presented being 548, besides ten full page plates. Special mention of each of these papers follows in their order as printed.

ANCIENT ART OF THE PROVINCE OF CHIRIQUI, COLOMBIA, BY WILLIAM H. HOLMES.

The archæology of Chiriqui should be studied, not only for comparison with that of the territory comprised in the present political divisions of North America, but because geographically the province should be considered as a part of the North American continent. Until recently this isthmian region was little known, the explorations for railroads and canals having furnished the first valuable accounts of its modern inhabitants and the relics left by former occupants.

The National Museum now contains a large and precious collection of archæologic material from the province, chiefly obtained by Mr. J. A. McNiel during years of enthusiastic labor. The information derived and the lessons to be learned from this collection, together with all particulars relating thereto gathered from other sources, are now presented in this paper by Mr. W. H. Holmes. His work in the classification of the immense number of objects and in the elucidation of their functions, material, construction, forms, and decorations has been careful and comprehensive. His manifest success has been owing to his artistic insight and skill as well as to his archæologic training. His ability in both fields can be appreciated by an examination of the 287 illustrations in his paper, con-

sidered not only as to their number, but as to their instructive arrangement in his text.

The objects of ancient art found in Chiriqui are, as elsewhere in North America, derived almost entirely from graves. The cemeteries, apart from their contents and the mode of sepulture, constitute in themselves topics of interest which are discussed and illustrated in the paper. Another curious feature is that the objects buried generally appear to have been manufactured for mortuary purposes and not for use by the living. A general review of the contents of the graves shows that the ancient inhabitants were skillful in the manipulation of stone, gold, copper, and clay, and tombs of undoubtedly great antiquity yield evidence of long continued culture.

It also appears that, while the art of the old peoples of the isthmus can in some respects be connected with that of adjacent regions in North America, in others it is remarkable for individuality. Ornaments of stone were seldom used by them and those of gold and copper were common. The articles of gold which the graves have yielded in large quantities to explorers during the last quarter of a century, and for which only they have until recently been searched, have generally been considered to be mere ornaments, but they probably had a fetichistic origin.

It is remarkable that no weapon, tool, or utensil of metal has been noticed The objects were generally formed by casting in molds, which was done with considerable skill, and gilding, or at least plating, was practiced. The art of alloying also appears to have been understood.

The use of metals does not appear early in the order of technology, and an advanced degree of culture is generally attained before the casting of any metal is attempted. Without allowing too much weight to any argument based upon the surprising skill of these people in plating and alloying, the evidence of technical skill in general, together with the conceptions embodied in their art, proves conclusively that it was the product of a long period of experiment and progress.

The pottery of Chiriqui is to be noted for the perfection of its technique, its high specialization of form, and its conven-

tional use of a wide range of decorative motives. Its forms present many striking analogies to the wheel made ware of the Mediterranean, regarded as classic.

The mythologic stage of the builders of these graves is shown by the fact that in their ceramic art there is no attempt to render the human face or figure with accuracy. The personages of their religious philosophy were zoömorphic and some of their forms may be discerned by a skillful analyst in or on all the ornaments and vessels. On each of the latter all decorative devices and delineations have some reference to the mythic creature associated with the vessel and its functions.

Mr. Holmes has made an important discovery in the evolution of decoration in Chiriqui from which are deduced instructive generalizations of wide application. All the decorations originate (doubtless under the influence of the stage reached in mythologic philosophy) in life forms of animals, none being vegetal. Coming from mythologic concepts they are significant and ideographic, and coming from nature they are primarily imitative and non-geometric. Nevertheless the agencies of modification inherent in the practice of art through its mechanical conditions are such that the animal forms early employed have changed into conventional decorative devices, among which are the meander, scroll, fret, chevron, and guilloche.

That this was the course of evolution of the classic forms of ornaments is not asserted; indeed, it is not necessary to form such a hypothesis, as by the interacting principles, well classified by Mr. Holmes, the course by which the same result was accomplished may have been wholly diverse. It is, however, shown that this was in all probability the particular and independent course in one region of America, being in that respect in distinct contrast to other art regions, such as that of the Pueblos, where the rise of geometric figures through technologic channels is equally obvious. It follows that in seeking to divide peoples by the criteria of their decorative arts the examination must embrace what is far more fundamental than a mere comparison of their finished products: these may be

and are markedly similar without any evidence of transmission, and when in fact by deeper study the ascertained separate courses of development preclude such transmission.

A STUDY OF THE TEXTILE ART IN ITS RELATION TO THE DEVELOPMENT OF FORM AND ORNAMENT, BY W. H. HOLMES.

For several years Mr. Holmes has been engaged in the study of the ancient and existing art of the North American Indians, and has published in the annual reports of this Bureau a number of elaborate essays upon the art of specified peoples and regions.

In the present paper he submits the comprehensive results of his studies in one great branch, the textile art, and treats chiefly of its esthetic relations as distinct from those of construction and function, so far as they can be separately discussed.

He has been fortunate in the character of the material studied. In America there is yet found a great body of primitive, indigenous, and independent art, almost uncontaminated by the complex phenomena, processes, and conditions which elsewhere obscure its origin and development. To a knowledge of American art acquired by long study Mr. Holmes adds a mental equipment exceptionally qualifying him for its philosophic discussion. His conclusions therefore, presented with ample evidence and explained by illustrations, are to be received as those of a recognized authority, although they may disturb some sentimental and metaphysical fancies concerning abstract beauty in form, color, and design.

It is not contended that the earliest concepts of beauty originated with textile art. On the contrary, it is probable that the first esthetic attempts were in the line of personal decoration, such as paints on the skin and pendants and feathers disposed about the person. But as the textile art appears early and widely in culture it is believed that the association of esthetic concepts with it very generally preceded their association with other arts. Having thus the start in the field, its nature was full of suggestions of embellishment, while it was fixed in its method of expression. The technique therefore

shaped and directed the esthetic concept and became the parent of much geometric ornament.

Mr. Holmes gives an instructive analysis of the forces and influences inherent in the textile art, the first lessons of which are order, uniformity, and symmetry; he shows how the necessities of technique determine ideas of the beautiful in linear geometric forms and how taste in selecting certain ornaments as the most beautiful is simply choosing that product which in the evolution of art gave it character and power.

The influence of textile ornament upon other forms of art, such as architecture and sculpture, is discussed, as also the manner in which extrinsic decorative elements are remodeled in accordance with the rules of textile combination. The paper, however, does not undertake to cover the whole field of the development of form and ornament, being confined to the relation of the textile art thereto, and similar studies in all other grand divisions of art must be made before the relative importance of all their forces and tendencies can be estimated. But the laws of evolution in all art closely correspond, and the present paper is eminently instructive to all students of the esthetic.

AIDS TO THE STUDY OF THE MAYA CODICES, BY CYRUS THOMAS.

That Prof. Cyrus Thomas has long been engaged in the examination of the few Maya records in existence is known from his former works, "A study of the Manuscript Troano" and "Notes on certain Maya and Mexican manuscripts," both published by the Bureau of Ethnology.

The object of the present paper is to give information of some original discoveries and to present some explanations not brought forward by Professor Thomas in his former papers.

The records of Maya and Mexico yet challenge students with unsolved problems similar to those which in the writings of Egypt and Assyria have perplexed so many generations. The translation of the paleographic literature of this continent may be expected to throw light on the past of America, in some degree reproducing the brilliant result which has attended the translation of the hieroglyphs of the eastern hemisphere. Long

and laborious comparisons, together with the trial of successive hypotheses, will be necessary to the decipherment of our aboriginal manuscripts, and but few competent persons are actively engaged in the work. It becomes, therefore, the duty of any one whose discoveries tend to clear up even minor points of the great problem to furnish them to his fellow laborers, and thereby limit the remaining field of investigation. In this paper Professor Thomas supplements his former work.

OSAGE TRADITIONS, BY REV. J. OWEN DORSEY.

This paper contains an account of a secret society of seven degrees, still existing among the Osage, in which the traditions of the people have been preserved. The author, by his skill and personal influence, has obtained and now furnishes two of these traditions in the original language, with an interlinear and a free translation of each and with explanatory remarks.

The traditions are both cosmologic and sociologic, and are admirable examples of Indian philosophy. The existence of secret associations, periodically celebrating religious mysteries, and of shamanistic orders, which, by ceremonies, pictographs, and chants, have preserved in more or less purity the traditions of their ancestors, has been vaguely known for some years, but until lately no accurate or indeed intelligent account of them has been secured.

The exertions of several of the officers of this Bureau have been successful in obtaining full details and clear explanations both of the traditions and the ceremonials of several of the Indian tribes, notably those of the Zuñi and the Navajo, published in former annual reports. The present paper by Mr. Dorsey takes an important place in this new collection of materials for the study of Indian philosophy, from which valuable results have been already acquired.

THE CENTRAL ESKIMO, BY DR. FRANZ BOAS.

For the express purpose of personal exploration and examination, the author of this important paper spent a considerable time in the region of which he treats. His course of travel

was to Cumberland sound and Davis strait. The grand division of the Eskimauan linguistic family, inhabiting nearly the whole range of the Arctic-American coast, which has been classed as Central Eskimo, occupies the northeastern part of the continent and the eastern islands of the Arctic-American archipelago. It inhabits, at Smith sound, the most northern countries in which man has been known to dwell. Its southern and western boundaries are about Fort Churchill, the middle part of Back river, and the coast west of Adelaide peninsula.

Dr. Boas gives an admirable account of the topography of the region and of the distribution, tribal divisions, and numbers of the inhabitants. His work is replete with valuable statements in minute detail and with acute suggestions regarding their habits and customs. Their peculiar and ingenious weapons, implements, and utensils are fully described and illustrated. His account of their religious practices and beliefs, supplemented by translations of their myths and legends, is equally entertaining and instructive.

In connection with his observations made through original research, Dr. Boas presents the result of a close study and analysis of the work of former explorers in this field, by which his contribution to the study of this interesting hyperborean people will command additional attention.

FINANCIAL STATEMENT.

Table showing amounts appropriated and expended for North American ethnology for the fiscal year ending June 30, 1885.

Expenses.	Amounts expended.	Amount appropriated.
A. Services	$30,433.55	
B. Traveling expenses	3,716.14	
C. Transportation of property	354.12	
D. Field subsistence	198.42	
E. Field supplies and expenses	535.45	
F. Field material	197.71	
G. Instruments	49.25	
H. Modeling material	40.11	
I. Photographic material	306.71	
K. Books and maps	355.85	
L. Stationery and drawing material	15.70	
M. Illustrations for reports	668.64	
N. Articles for distribution to Indians	23.69	
O. Office furniture	59.67	
P. Office supplies and repairs	36.61	
Q. Manuscripts	395.00	
R. Correspondence	15.43	
S. Specimens	71.00	
T. Collection of material for classification of the Indians in the United States	1,326.61	
Balance on hand to meet outstanding liabilities	1,200.34	
	40,000.00	$40,000.00

ACCOMPANYING PAPERS.

ANCIENT ART

OF THE

PROVINCE OF CHIRIQUI, COLOMBIA.

BY

WILLIAM H. HOLMES.

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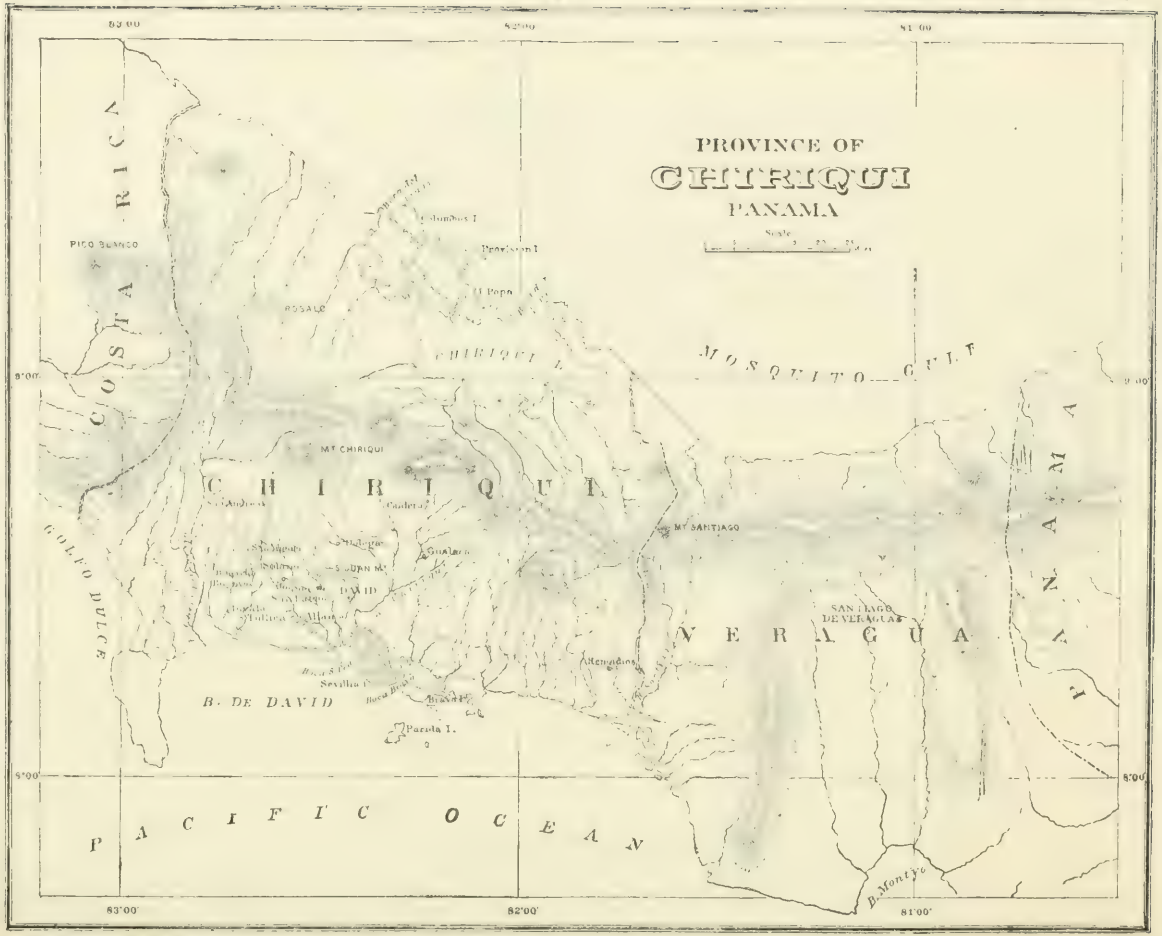

PROVINCE OF
CHIRIQUI
PANAMA
COSTA RICA
PICO BLANCO
ROSALO
CHIRIQUI L.
MOSQUITO GULF
MT CHIRIQUI
CHIRIQUI
MT SANTIAGO
S. JUAN Mt
DAVID
GULFO DULCE
B. DE DAVID
Parida I.
SAN IAGO DE VERAGUAS
VERAGUA
PANAMA
PACIFIC OCEAN
B. Montijo
83°00'
82°00'
81°00'
9°00'
8°00'

ANCIENT ART OF THE PROVINCE OF CHIRIQUI.

By William H. Holmes.

INTRODUCTION.

GEOGRAPHY.

Until comparatively recent times the province of Chiriqui has remained almost unknown to the world at large. The isthmus was traversed a number of times by the conquerors, who published accounts of their discoveries, but it was reserved for the period of railroad and canal exploration to furnish trustworthy accounts of its character and inhabitants. The situation of Chiriqui is unique. Forming, politically, a part of South America, it belongs in reality to the North American continent. It occupies a part of the great southern flexure of the isthmus at a point where the shore lines begin finally to turn toward the north.

The map accompanying this paper (Plate I) conveys a clear idea of the position and the leading topographic features of the province. The boundaries separating it from Veragua on the east and Costa Rica on the west run nearly north and south. The Atlantic coast line has a northwest and southeast trend and is indented by the bay or lagoon of Chiriqui. The Bay of David extends into the land on the south and the Gulf of Dolce forms a part of the western boundary. A range of mountains, consisting principally of volcanic products, extends midway along the province, forming the continental watershed.[1] The drainage comprises two systems of short rivers that run, one to the north and the other to the south, into the opposing oceans. Belts of lowland border the shore lines. That on the south side is from twenty to thirty miles wide and rises gradually into a plateau two or three thousand feet in elevation, which is broken by hills and cut by cañons. This belt affords a natural thoroughfare for peoples migrating from continent to continent, and doubtless formed at all periods an attractive district for occupation. It is in the middle portion of this strip of lowland, especially in the drainage area of the Bay of David, that the most plentiful evidences of ancient occupation are found. Scattering remains have been discovered all along, however, connecting the art of Costa Rica with that of Veragua, Panama, and

[1] For physical features, see report of Lieutenant Norton (Report Chiriqui Commission, Ex. Doc. 41, 1860).

the South American continent. The islands of the coast furnish some fragmentary monuments and relics, and there is no doubt that a vast quantity of material yet remains within the province to reward the diligent search of future explorers.

LITERATURE.

The antiquarian literature of the province is extremely meager, being confined to brief sketches made by transient visitors or based for the most part upon the testimony of gold hunters and government explorers, who took but little note of the unpretentious relics of past ages. As there are few striking monuments, the attention of archæologists was not called to the history of primeval man in this region, and until recently the isthmus was supposed to have remained practically unoccupied by that group of cultured nations whose works in Peru and in Mexico excite the wonder of the world. But, little by little, it has been discovered that at some period of the past the province was thickly populated, and by races possessed of no mean culture.

The most important contributions to the literature of this region, so far as they have come to my knowledge, are the following: A paper by Mr. Merritt, published by the American Ethnological Society;[1] a paper by Bollaert, published by the same society, and also a volume issued in London;[2] a valuable pamphlet, with photographic illustrations, by M. De Zeltner, French consul to Panama in 1860;[3] a short paper by Mr. A. L. Pinart, published in the Bulletin de la Société de Géographie (Paris, 1885, p. 433), in which he gives valuable information in regard to the peoples, ancient and modern; and casual notes by a number of other writers, some of which will be referred to in the following pages. A pretty full list of authorities is given by Mr. H. H. Bancroft in his Native Races, Vol. V, p. 16.

One of the most important additions to our knowledge of the province and its archæologic treasures is furnished in the manuscript notes of Mr. J. A. McNiel, who made the greater part of the collection now deposited in the National Museum. This explorer has personally supervised the examination of many thousands of graves and has forwarded the bulk of his collections to the United States. His explorations have occupied a number of years, during which time he has undergone much privation and displayed great enthusiasm in pursuing the rather thorny pathways of scientific research. In the preparation of this paper his notes have been used as freely as their rather disconnected character warranted, and since Mr. McNiel's return to the United States, in July, 1886, I have been favored with a

[1] J. King Merritt: "Report on the huacals or ancient graveyards of Chiriqui." Bulletin of the American Ethnological Society, 1860.

[2] Bollaert: Antiquarian Researches in New Granada. London, 1860.

[3] A. De Zeltner: Notes sur les sépultures indiennes du département de Chiriqui.

series of interviews with him, and by this means much important information has been obtained.

PEOPLE.

At the present time this district is inhabited chiefly by Indians and natives of mixed blood, who follow grazing and agriculture to a limited extent, but subsist largely upon the natural products of the country. These peoples are generally thought to have no knowledge or trustworthy tradition of the ancient inhabitants and are said to care nothing for the curious cemeteries among which they dwell, except as a source of revenue. Mr. A. L. Pinart states, however, that certain tribes on both sides of the continental divide have traditions pointing toward the ancient grave builders as their ancestors. There is probably no valid reason for assigning the remains of this region to a very high antiquity. The highest stage of culture here may have been either earlier or later than the period of highest civilization in Mexico and South America or contemporaneous with it. There is really no reason for supposing that the tribes who built these graves were not in possession of the country, or parts of it, at the time of the conquest. As to the affinities of the ancient middle isthmian tribes with the peoples north and south of them we can learn nothing positive from the evidences of their art. So far as the art of pottery has come within my observation, it appears to indicate a somewhat closer relationship with the ancient Costa Rican peoples than with those of continental South America; yet, in their burial customs, in the lack of enduring houses and temples, and in their use of gold, they were like the ancient peoples of middle and southern New Granada.[1]

The relics preserved in our museums would seem to indicate one principal period of occupation or culture only; but there has been no intelligent study of the contents of the soil in sections exposed in modern excavations, the exclusive aim of collectors having generally been to secure either gold or showy cabinet specimens. The relics of very primitive periods, if such are represented, have naturally passed unnoticed. Mr. McNiel mentions the occurrence of pottery in the soil in which the graves were dug, but, regarding it as identical with that contained in the graves, he neglected to preserve specimens.

In one instance, while on a visit to Los Remedios, a pueblo near the eastern frontier of Chiriqui, he observed a cultivated field about which a ditch some 8 or 9 feet in depth had been dug. In walking through this he found a continuous exposure of broken pottery and stone implements. Some large urns had been cut across or broken to conform to the slope of the ditch, and were exposed in section.

[1] R. B. White: Jour. Anthrop. Inst. Great Britain and Ireland, p. 241. February, 1884.

Although not apparently representing a very wide range of culture or distinctly separated periods of culture, the various groups of relics exhibit considerable diversity in conception and execution, attributable, no doubt, to variations in race and art inheritance.

THE CEMETERIES.

The ancient cemeteries, or huacals, as they are called throughout Spanish America, are scattered over the greater part of the Pacific slope of Chiriqui. It is said by some that they are rarely found in the immediate vicinity of the sea, but they occur in the river valleys, on the hills, the plateaus, the mountains, and in the deepest forests. They are very numerous, but generally of small extent. The largest described is said to cover an area of about twelve acres. They were probably located in the immediate vicinity of villages, traces of which, however, are not described by explorers; but there can be no doubt that diligent search will bring to light the sites of dwellings and towns. The absence of traces of houses or monuments indicates either that the architecture of this region was then, as now, of destructible material, or, which is not likely, that so many ages have passed over them that all traces of unburied art, wood, stone, or clay, have yielded to the "gnawing tooth of time."

One of the most circumstantial accounts of these burial places is given by Mr. Merritt, who was also the first to make them known to science.[1] Mr. Merritt was director of a gold mine in Veragua, and in the summer of 1859 spent several weeks in exploring the graves of Chiriqui; he therefore speaks from personal knowledge. In the autumn of 1858 two native farmers of the parish of Bugaba, or Bugava, discovered a golden image that had been exposed by the uprooting of a plant. They proceeded secretly to explore the graves, the existence of which had been known for years. In the following spring their operations became known to the people, and within a month more than a thousand persons were engaged in working these extraordinary gold mines. The fortunate discoverers succeeded in collecting about one hundred and thirty pounds weight of gold figures, most of which were more or less alloyed with copper. It is estimated that fifty thousand dollars' worth in all was collected from this cemetery, which embraced an area of twelve acres.

Although there are rarely surface indications to mark the position of the graves, long experience has rendered it comparatively easy to discover them. The grave hunter carries a light iron rod, which he runs into the ground, and thus, if any hard substance is present, discovers the existence of a burial. It is mentioned by one or two writers that the graves are in many cases marked by stones, either loose or set in the ground in rectangular and circular arrangements. The

[1] J. King Merritt: Paper read before the American Ethnological Society, 1860.

graves do not often seem to have had a uniform position in relation to one another or to the points of the compass. In some cases they are clustered about a central tomb, and then assume a somewhat radiate arrangement; again, according to Mr. McNiel, they are sometimes placed end to end, occupying long trenches.

THE GRAVES.

Graves of a particular form are said to occur sometimes in groups occupying distinct parts of the cemetery, but the observations are not sufficiently definite to be of value. The graves vary considerably in form, construction, and depth, and are classified variously by explorers. In the Bugaba cemetery Mr. Merritt found two well marked varieties, the oval and the quadrangular, reference being had to the horizontal section. The oval grave pits were from 4½ to 6 feet deep and from 3 to 4 feet in greatest diameter. A wall of rounded river stones 2½ to 3 feet high lined the lower part of the pit, and from the top of this the entire space was closely packed with rounded stones. Within the faced up part of this cist the remains of the dead, the golden figures, pottery, and implements had been deposited. This form is illustrated in Fig. 1 by a vertical section constructed from the description given by Mr. Merritt.

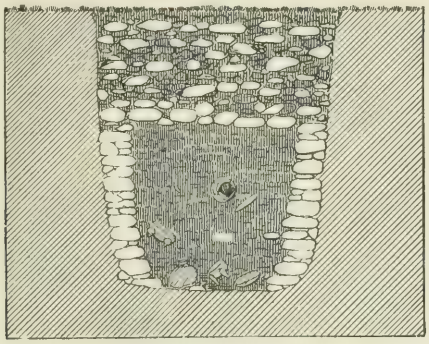


FIG. 1. Section of oval grave.

The quadrangular graves were constructed in two somewhat distinct ways. One variety was identical in most respects with the oval form illustrated above. They were sometimes as much as 6 feet deep and frequently 4 by 7 feet in horizontal dimensions. In the other form a pit 4 by 6½ feet in diameter was sunk to the depth of about 3 feet. Underneath this another pit some 2 feet in depth was sunk, leaving an offset or terrace 8 or 10 inches in width all around. The smaller pit was lined with flat stones placed on edge. In this cist the human remains and the relics were placed and covered over with flat stones, which rested upon the terrace and prevented the superincumbent mass, which consisted of closely packed river stones, from

crushing the contents. A section of this tomb is given in Fig. 2, also drawn from the description given by Mr. Merritt.

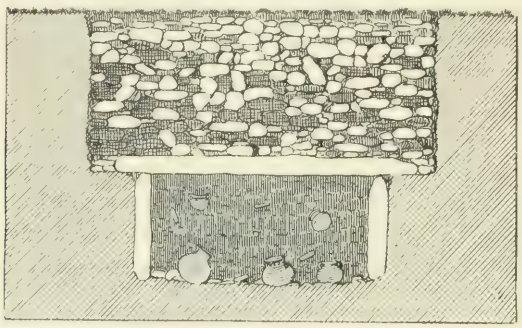


FIG. 2. Section of a quadrangular grave, showing the surface pack of river stones and the positions of the slabs and objects of art.

Mr. Merritt and others mention that in some of the graves pillars are employed to support the roof of the cist. These pillars are mentioned briefly by De Zeltner, from whose account the following illustrations are drawn. This author does not state that he made any personal investigations, and if his accounts were obtained from the natives their entire trustworthiness may very properly be questioned. The first two forms mentioned by him are similar to those already given. The third is described as having at the corners square pillars of stone to support the covering, which, however, is not described. The fourth has four pillars, placed in the corners of the pit. These serve to support a vault of flagstones. The walls between the pillars are faced with pebbles, as in the cases previously described.

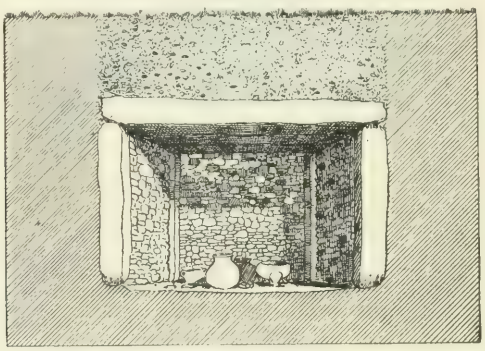


FIG. 3. Grave with pillars, described by De Zeltner.

Fig. 3 will make this form clear at a glance. The fifth variety described by De Zeltner is quite extraordinary in construction. His account is somewhat confusing in a number of respects, and the section given in Fig. 4 cannot claim more than approximate accuracy in details and measurements. Near the surface a paving, perhaps

of river stones, was found covering an area of about 10 by 13 feet. This paving was apparently the surface of a pack about 2 feet thick,

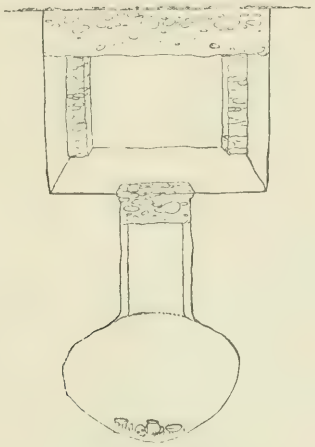


FIG. 4. Compound cist, described by De Zeltner.

and covered the mouth of the main pit, which was some 6 or 7 feet deep. Pillars of cobble stones about 10 inches in diameter occupied the corners of the pit, and probably served in a measure to support the paving. In the bottom of this excavation a second pit was dug, the mouth of which was also covered by a paving 2½ by upwards of 3 feet in horizontal dimensions. This lower pit consisted of a shaft several feet in depth, by which descent was made into a chamber of inverted pyramidal shape. This chamber approximated 6 by 9 feet in horizontal dimensions and was some 4 or 5 feet deep. At the bottom of this cistern the human remains and most of the relics were deposited. The shaft was filled in with earth and the pavings described. The total depth, computed from the figures given, is about 18 feet, a most remarkable achievement for a barbarous people; yet this is equaled by the ancient tribes of the mainland of New Granada, where similar burial customs seem to have prevailed. Mr. White,[1] who traveled extensively in the northwestern part of the state, says:

A dry, elevated ridge, composed of easily excavated material, was selected as the cemetery. A pit of only a yard or so in diameter was sunk, sometimes vertically, sometimes at an angle, or sometimes it varied from vertical to inclined. It was sunk to depths varying from 15 to 60 feet, and at the bottom a chamber was formed in the earth. Here the dead was deposited, with his arms, tools, cooking utensils, ornaments, and chattels generally, with maize and fermented liquor made of maize. The chamber and passage were then rammed tightly full of earth, and sometimes it would appear that peculiar earth, other than that excavated on the spot, was used. One not unfrequently detects a peculiar aromatic smell in the earth, and fragments of charcoal are always found mixed with it in more or less quantity.

[1] B. B. White: Jour. Anthrop. Inst. Great Britain and Ireland, p. 246. February, 1884.

M. De Zeltner describes other very simple graves which are filled in with earth, excepting a surface paving of pebbles.

Mr. McNiel, who has examined more examples than any other white man, and over a wide district with David as a center, discredits the statements of De Zeltner in respect to the form illustrated in Fig. 4, and states that generally the graves do not differ greatly in shape and finish from the ordinary graves of to-day. He describes the pits as being oval and quadrangular and as having a depth ranging from a few feet to 18 feet. The paving or pack consists of earth and water worn stones, the latter pitched in without order and forming but a small percentage of the filling. He has never seen such stones used in facing the walls of the pit or in the construction of pillars. The flat stones which cover the cist are often 10 or 15 feet below the surface and are in some cases very heavy, weighing 300 pounds or more. A single stone is in cases large enough to cover the entire space, but more frequently two or more flat stones are laid side by side across the cavity. These are supported by river stones, a foot or more in length, set around the margin of the cist. He is of the opinion that both slabs and bowlders were in many cases carried long distances. No one of the pits examined was of the extraordinary form described in detail by De Zeltner and others.

HUMAN REMAINS.

The almost total absence of human remains has frequently been remarked, and the theory is advanced that cremation must have been practiced. We have no evidence, however, of such a custom among the historic tribes of this region, and, besides, such elaborate tombs would hardly be constructed for the deposition of ashes. Yet, considering the depth of the graves, their remarkable construction, and the character of the soil selected for burial purposes, it is certainly wonderful that such meager traces of human remains are found. Pinart surmises, from the analogies of modern burial customs upon the north coast, that the bones only were deposited in the graves, the flesh having been allowed to decay by a long period of exposure in the open air. This, however, would probably not materially hasten the decay of the bones.

Mr. Merritt states that human hair was obtained from graves at Bugaba, and that he has himself secured the enamel of a molar tooth from that locality. De Zeltner tells us that in three varieties of graves remains of skeletons are found, always, however, in a very fragile condition. One skull was obtained of sufficient stability to be cast in plaster, but De Zeltner is not certain that it belonged to the people who built the tombs.

Mr. McNiel reports the occasional finding of bones, and a number of bundles of them are included in his collection. He reports that there are no crania and that nothing could be determined as to the position of the bodies when first buried.

Pinart observes that in some cases the bodies or remnants of bodies were distributed about the margin of the pit bottom, with the various utensils in the center, and again that the remains were laid away in niches dug in the sides of the main pit.

These scattering observations will serve to give a general idea of the modes of sepulture practiced in this region, but there must be a closer record of localities and a careful correlation of the varying phenomena of inhumation before either ethnology or archæology can be greatly benefited.

PLACING OF RELICS.

The pieces of pottery, implements, and ornaments were probably buried with the dead, pretty much as are similar objects in other parts of America. The almost total disappearance of the human remains makes a determination of exact relative positions impossible. The universal testimony, however, is that all were not placed with the body, but that some were added as the grave was filled up, being placed in the crevices of the walls or pillars or thrown in upon the accumulating earth and pebbles of the surface pavement. The heavy implements of stone are rarely very far beneath the surface.

OBJECTS OF ART.

From the foregoing account it is apparent that our knowledge of the art of ancient Chiriqui must for the present be derived almost entirely from the contents of the tombs. The inhabitants were skillful in the employment and the manipulation of stone, clay, gold, and copper; and the perfection of their work in these materials, taken in connection with the construction of their remarkable tombs, indicates a culture of long standing and a capacity of no mean order.

Of their architecture, agriculture, or textile art we can learn little or nothing.

The relics represented in the collection of the National Museum consist chiefly of articles of stone, gold, copper, and clay.

STONE.[1]

Works executed in stone, excluding the tombs, may be arranged in the following classes: Pictured rocks, sculptured columns, images, mealing stones, stools, celts, arrowpoints, spearpoints(?), polishing stones, and ornaments.

Pictured rocks.— Our accounts of these objects are very meager. The only one definitely described is the "*piedra pintal.*" A few of the figures engraved upon it are given by Seemann, from whom I quote the following paragraph:

[1] I am indebted to Mr. J. S. Diller, of the United States Geological Survey, for the determination of the species of stone in this series of objects.

At Caldera, a few leagues [north] from the town of David, lies a granite block known to the country people as the piedra pintal, or painted stone. It is 15 feet high, nearly 50 feet in circumference, and flat on the top. Every part, especially the eastern side, is covered with figures. One represents a radiant sun; it is followed by a series of heads, all, with some variation, scorpions and fantastic figures. The top and the other side have signs of a circular and oval form, crossed by lines. The sculpture is ascribed to the Dorachos (or Dorasques), but to what purpose the stone was applied no historical account or tradition reveals.[1]

These inscriptions are irregularly placed and much scattered. They are thought to have been originally nearly an inch deep, but in places are almost effaced by weathering, thus giving a suggestion of great antiquity. I have seen tracings of these figures made recently by Mr. A. L. Pinart which show decided differences in detail, and Mr. McNiel gives still another transcript. I present in Fig. 5 Mr. McNiel's sketch of the southwest face of the rock, as he has given considerably more detail than any other visitor. Mr. McNiel's sketches show

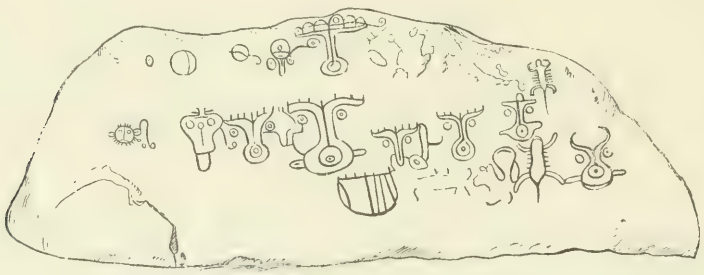


FIG. 5. Southwest face of the pictured stone.

seventeen figures on the opposite side of the rock. Seemann gives only twelve, while Mr. Pinart's tracings show upwards of forty upon the same face. These three copies would not be recognized as referring to the same original. That of Mr. Pinart seems to show the most careful study and is probably accurate. Good photographs would be of service in eliminating the inconvenient personal equation always present in the delineation of such subjects. These figures bear little resemblance to those painted upon the vases of this region.

Other figures are said to be engraved upon the bowlders and stones used in constructing the burial cists. De Zeltner states that "one often meets with stones covered with rude allegorical designs, representing men, pumas (tigre?), and birds. It is particularly in such huacas as have pillars and a vault that these curious specimens of Indian art are found."[2]

Columns.—A number of authors speak casually of sculptured stone columns, none of which have been found in place. Seemann

[1] Seemann: Voy. Herald, Vol. I, p. 312.

[2] A. de Zeltner: Notes sur les sépultures indiennes du département de Chiriqui.

says that they may be seen in David, where they are used for building purposes,[1] but this is not confirmed by others. The sculptures are said to be in relief, like those of Yucatan and Peru. Cullen says that columns are found on the Island of Muerto, Bay of David.[2] Others are mentioned as having been seen in Veragua.

Images.—Objects that may properly be classed as images or idols are of rather rare occurrence. Half a dozen specimens are found in the McNiel collections. The most important of these represents a full length female figure twenty-three inches in height. It is executed in the round, with considerable attempt at detail (Fig. 6). I may mention, as strong characteristics, the flattened crown, encircled by a narrow turban-like band, the rather angular face and prominent nose, and the formal pose of the arms and hands. Besides the head band, the only other suggestion of costume is a belt about the waist

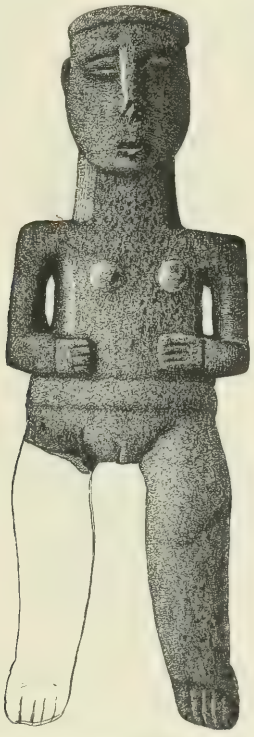


FIG. 6. A goddess of the ancient Chiriquians. Gray basalt — ½.

The material is a compact, slightly vesicular, olive gray, basaltic rock. I have seen a few additional examples of this figure, and from the identity in type and detail conclude that the personage represented was probably an important one in the mythology of the Chiri-

[1] Seemann: Voy. Herald, Vol. I. p. 313.
[2] Cullen's Darien, p. 38.

quians. In general style there is a rather close correspondence with the sculptures of the Central American States. Some of the plastic characters exhibited in this work appear also in the various objects of clay, gold, and copper described further on.

There is also a smaller, rudely carved, half length, human figure done in the same style. Besides these figures there are two large flattish stones, on one of which a rude image of a monkey has been picked, while the other exhibits the figure of a reptile resembling a lizard or a crocodile. The work is extremely rude and has the appearance of being unfinished. It seems that all of these objects were found upon the surface of the ground.

In Figs. 7 and 8 I present two specimens of sculpture also collected by Mr. McNiel, and now in the possession of Mr. J. B. Stearns, of Short Hills, N. J. The example shown in Fig. 7 was obtained near the Gulf of Dolce, 82° 55′ west. Three views are presented: profile, front, and back. It is carved from what appears to be a compact, grayish

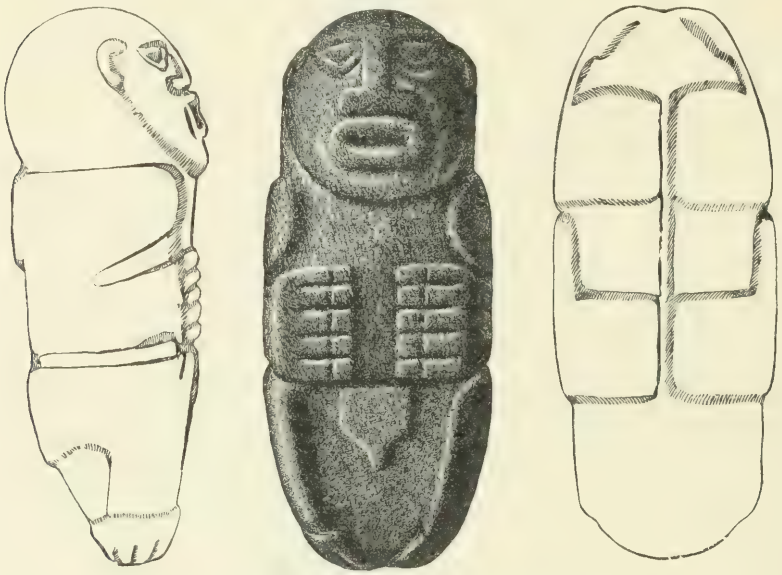


FIG. 7. A god of the ancient Chiriquians. Gray volcanic rock ←¼.

olive tufa or basalt, and represents a male personage, distinct in style from the female figure first presented. The head is rounded above, the arms are flattened against the sides, and the feet are folded in a novel position beneath the body. The height is 9 inches.

The other specimen, Fig. 8, from near the same locality, is carved from a yellowish gray basalt which sparkles with numerous large crystals of hornblende. It is similar in style to the last, but more boldly sculptured, the features being prominent and the members of the body in higher relief. The legs are lost. Height, 5¼ inches.

A remarkable figure of large size now in the National Museum was obtained from the Island of Cana or Cano by Mr. McNiel. It is

a *b*

FIG. 8. Fragmentary human figure in gray basaltic rock — ¼.

nearly three feet in height and very heavy. The face has been mutilated. In general style it corresponds more closely to the sculpture of the Central American States than to that of Chiriqui.

Mealing stones.—The metate, or hand mill, which consists of a concave tablet and a rubbing stone, was an important adjunct to the household appliances of nearly all the more cultured American nations. It is found not only in those plain substantial forms most suitable for use in grinding grain, seeds, and spices by manual means, but in many cases it has been elaborated into a work of art which required long and skilled labor for its production.

In the province of Chiriqui these mills must have been numerous; but, since they are still in demand by the inhabitants of the region, many of the ancient specimens have been destroyed by use. It seems from all accounts that they were not very generally buried with the dead, but were left upon or near the surface of the ground, and were hence accessible to the modern tribes, who found it much easier to transport them to their homes than to make new ones.

The metates of Chiriqui present a great diversity of form and possibly represent distinct peoples or different grades of culture. They are carved from volcanic rocks of a few closely related varieties, the texture of which is coarse and occasionally somewhat cellular, giving an uneven or pitted surface, well suited to the grinding of maize. Three classes, for convenience of description, may be distinguished, although certain characters are common to all and one form grades

more or less completely into another. We have the plain slab or rudely hewn mass of rock, in the upper surface of which a shallow depression has been excavated; we have the carefully hewn oval slab supported by short legs of varied shape; and we have a large number of pieces elaborately sculptured in imitation of animal forms. The first variety is common to nearly all temperate and tropical America and does not require further attention here. The second variety exhibits considerable diversity in form. The tablet is oval, concave above, and of an even thickness. The periphery is often squared and is in many cases ornamented with carved figures, either geometric devices or rudely sculptured animal heads. The legs are generally three in number, but four is not unusual. They are mostly conical or cylindrical in shape and are rather short.

The finest example of the second class has an oval plate 37 inches in length, 29 in width, and 2 inches thick, which is nearly symmetrical and rather deeply concave above. The central portions of the basin are worn quite smooth. Near the ends, within the basin, two pairs of small animal-like figures are carved, and ranged about the lower margin of the periphery are eighty-seven neatly sculptured heads of animals. There are four short cylindrical legs. This superb piece of work is shown in Fig. 9.

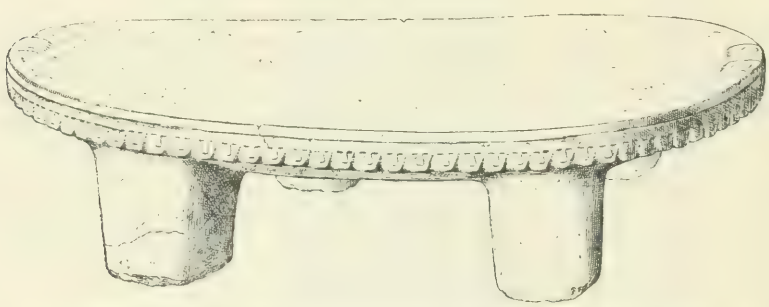


FIG. 9. Mealing stone with large tablet ornamented with animal heads, from Gualaca — $\frac{1}{5}$.

Examples of the third class are all carved to imitate the puma or ocelot. The whole creature is often elaborately worked out in the round from a single massive block of stone. The thin tablet representing the body rests upon four legs. The head, which projects from one end of the tablet, is generally rather conventional in style, but is sculptured with sufficient vigor to recall the original quite vividly. The tail appears at the other end and curves downward, connecting with one of the hind feet, probably for greater security against mutilation. The head, the margin of the body, and the exterior surfaces of the legs are elaborately decorated with tasteful carving. The figures are geometric, and refer, no doubt, to the markings of the animal's skin. Nearly identical specimens are obtained from Costa Rica and other parts of Central America.

A fine example of medium size is given in Fig. 10. The material is gray, minutely cellular, basaltic rock. The upper surface of the plate is polished by use. The entire length is 17 inches.

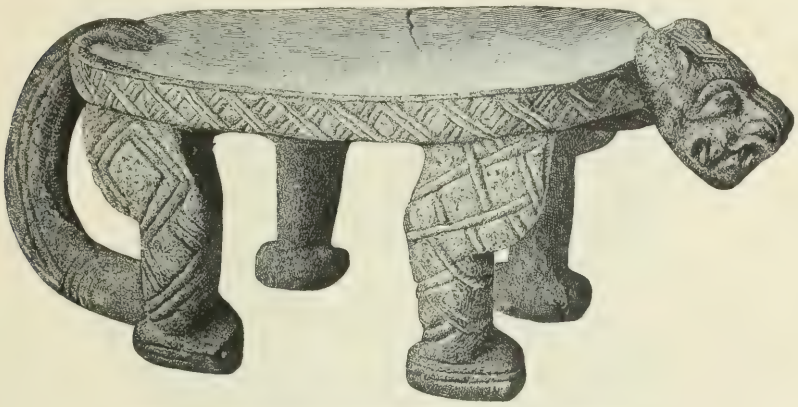


FIG. 10. Puma shaped metate of gray andesite, from Rio Joca -$\frac{1}{4}$.

The largest specimen in the McNiel collection is 2 feet long, 18 inches wide, and 12 inches high. A similar piece has been illustrated by De Zeltner.

The usual office of these metates is considered to be that of grinding corn, cocoa, and the like. The great elaboration observed in some examples suggests the idea that perhaps they were devoted exclusively to the preparation of material (meal or other substances) intended for sacred uses. A high degree of elaboration in art products results in many cases from their connection with superstitious usages.

Speculating upon the use of these objects, De Zeltner mentions a mortar "whose pestle was nothing but a round stone, which still shows traces of gold here and there. It was evidently with the help of this rude instrument that the Indians reduced the gold to powder before fusing it."[1]

The implement or pestle used in connection with these mealing tablets in crushing and grinding is often a simple river worn pebble, as mentioned above, but is more usually a cylindrical mass of volcanic rock, worked into nearly symmetric shape.

Stools.—The stool-like appearance of some of the objects described as metates suggests the presentation in this place of a group of objects that must for the present be classed as stools or seats, although their true or entire function is unknown to me. They are distinguished from the mealing stones by their circular plate, their sharply defined, upright, marginal rim, and the absence of signs of use.

Two of these objects are from the vicinity of David. The largest

[1] A. De Zeltner: Notes sur les sépultures indiennes, p. 7.

and most interesting is illustrated in Fig. 11. It is carved from a piece of vesicular basaltic tufa and is in a perfect state of preservation. The height is 6 inches and the diameter of the top 10 inches, that of

FIG. 11. Stool shaped object carved from gray, minutely cellular basalt — $\frac{1}{4}$.

the base being a little less. The slightly concave upper surface is depressed about half an inch below the upright marginal band. The periphery is a little more than an inch in width and is decorated with a simple guilloche-like ornament in relief. The disk-like cap is connected by open lattice-like work with the ring which forms the base.

FIG. 12. Stool with columnar base, carved from gray basaltic rock — $\frac{1}{4}$.

The interior is neatly hollowed out. The open work of the sides consists of two elaborately carved figures of monkeys, alternating with two sections of trellis work, very neatly executed. The other specimen is somewhat less elaborate in its sculptured ornament

Outlines of two additional examples of these objects are given in Figs. 12 and 13. The tablets are round, thick, and slightly concave

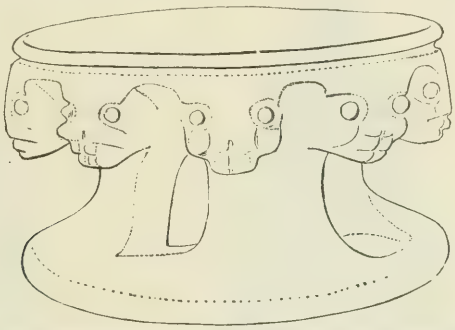


FIG. 13. Stool with perforated base, carved from gray basaltic rock—$\frac{1}{3}$.

above and are margined with rows of sculptured heads. The supporting column in the first is a plain shaft and the base is narrow and somewhat concave underneath. In the second the column is hollowed out and perforated.

As bearing upon the possible use of these specimens it should be noticed that similar stool-like objects are made of clay, the softness and fragility of which would render them unsuitable for use as mealing plates or mortars, and it would also appear that they are rather fragile for use as stools. I would suggest that they may have served as supports for articles such as vases or idols employed in religious rites, or possibly as altars for offerings.

Celts.—The class of implements usually denominated celts is represented by several hundred specimens, nearly all of which are in a perfect state of preservation. They are thoroughly well made and beautifully finished, and leave the impression upon the mind that they must represent the very highest plane of Stone Age art.

Although varying widely in form and finish there is great homogeneity of characters, the marked family resemblance suggesting a single people and a single period or stage of culture. They are found in the cists along with other relics and are very generally distributed, a limited number, rarely more than three, being found in a single grave. They may be classified by shape into a number of groups, each of which, however, will be found to grade more or less completely into the others. They display all degrees of finish from the freshly flaked to the evenly picked and wholly polished surface. The edges or points of nearly all show the contour and polish that come from long though careful use. All are made of compact, dark, volcanic tufa that resembles very closely a fine grained slate. The following illustrations include all the more important types of form. There are but few specimens of very large size. That shown in Fig. 14 is $8\frac{1}{4}$ inches long, 4 inches wide, and seven-eighths of an inch thick. The blade is broad at the edge, rounded in outline, and well polished. The upper

end terminates in a rather sharp point that shows the rough flaked surface of the original blocking out. The middle portion exhibits an

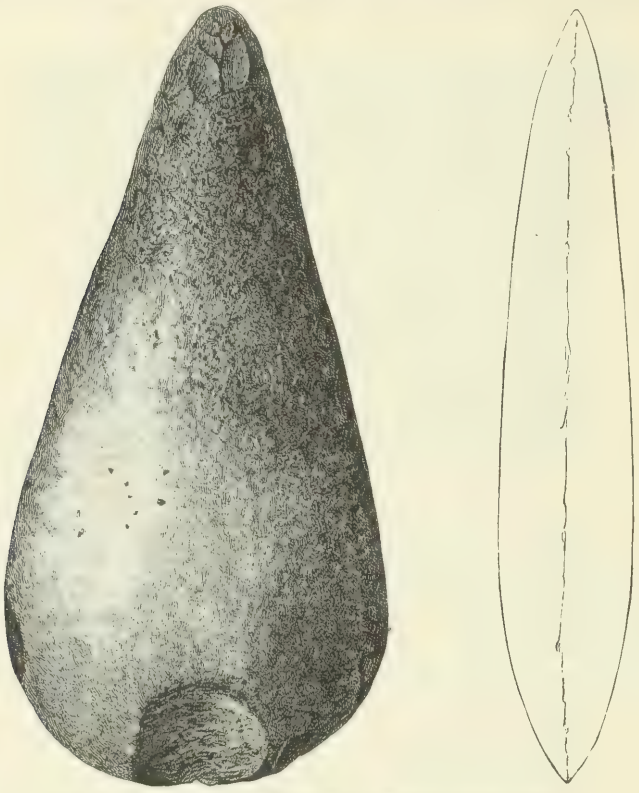


Fig. 14. Large partially polished celt of mottled volcanic tufa — ¹.

evenly picked surface. The rock is a dark slaty looking tufa, the surface of which displays ring or rosette-like markings, reminding one of the polished surface of a section of fossil coral. These markings probably come from the decomposition of the mineral constituents of the rock.

The implement given in Fig. 15 may be taken as a type of a large class of beautifully finished celts. It also is made of the dark tufa, very fine grained and compact, resembling slate. The beveled surfaces of the blade are well polished, the remainder of the surface being evenly picked. The hexagonal section is characteristic of the class, but it is not so decided in this as in some other pieces in which the whole surface is freshly ground.

The contraction of the lateral outline and the sudden expansion on reaching the cutting edge noticed in this specimen are more clearly marked in other examples. The small celt shown in Fig. 16 is narrow above and quite wide toward the edge. A wide, thick specimen is

given in Fig. 17. A specimen quite exceptional in Chiriqui is shown in Fig. 18. Mr. McNiel states that in many years' exploration this is the only piece seen that exhibits the constriction of outline characteristic of grooved axes.

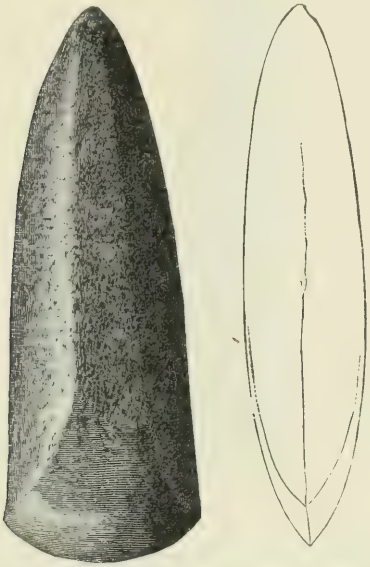


FIG. 15. Celt of hexagonal section made of dark compact tufa —½.

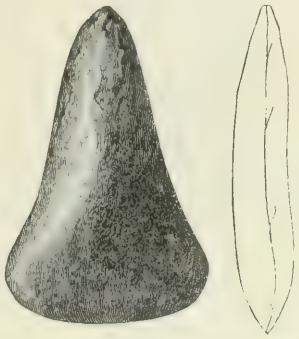


FIG. 16. Small wide bladed celt made of dark tufa —½.

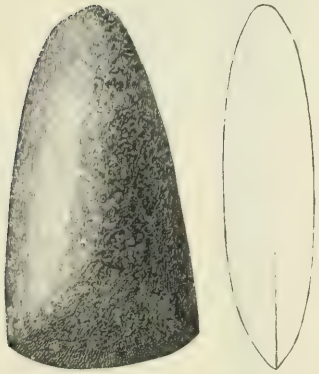


FIG. 17. Celt with heavy shaft made of dark speckled tufa —½.

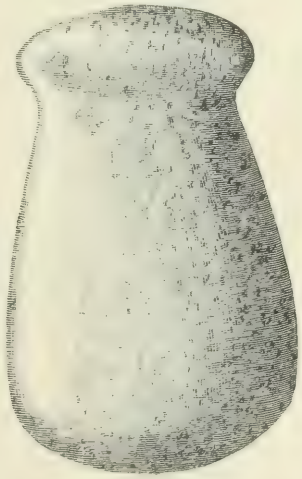


FIG. 18. Celt or ax with constriction near the top.

Two superb implements are illustrated in Figs. 19 and 20, the one in the rough excepting at the cutting edge, where it is ground into the desired shape, and the other neatly polished over nearly the entire

surface. The surfaces are somewhat whitened from decomposition, but within the rock is nearly black, and the eye could not distinguish

FIG. 19. Flaked and partially polished celt of dark tufa ½.

FIG. 20. Well polished celt of dark tufa—¼.

it from a dark slate. The material is shown by microscopic test to be a volcanic tufa. These examples were evidently intended for more

FIG. 21. Narrow pointed celt of dark tufa ½.

FIG. 22. Narrow pointed celt of dark tufa ½.

delicate work than the preceding. The shapes of the specimens illustrated in Figs. 21 and 22 indicate a still different use. The upper

end of the implement is large and rough, as if intended to facilitate holding or hafting, while the shaft diminishes in size below, terminating in a narrow, symmetrical, highly polished edge, a shape well

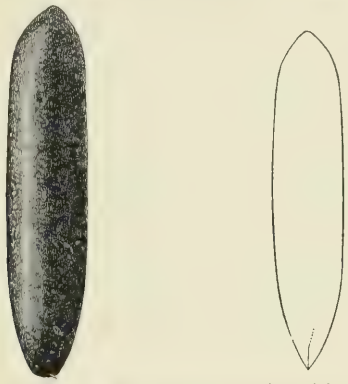


FIG. 23. Cylindrical celt with narrow point, of dark tufa – ½.

calculated to unite delicacy and strength. The highest mechanical skill could hardly give to stone shapes more perfectly adapted to the

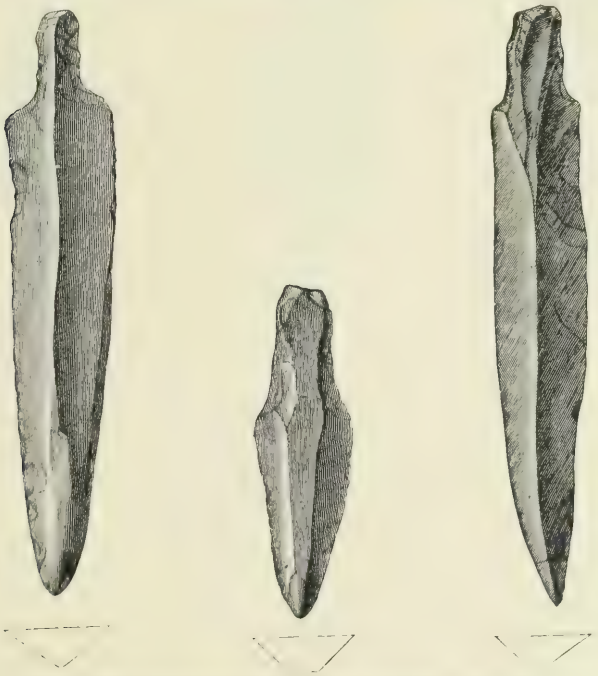


FIG. 24. Leaf shaped objects suggesting spearpoints, of dark tufa – ½.

manipulation of stone, metal, or other hard or compact substances. The material is a very dark, compact, fine grained tufa.

An additional example is given in Fig. 23. The shaft is cylindri-

cal and terminates in a conical point at one end and in a very narrow, abrupt, cutting edge at the other. The whole surface is polished. The material is the same dark tufa.

The class of objects illustrated in this and the two preceding cuts comprises but a small percentage of the chisel-like implements.

Spearheads (?).—Another class of objects made of the same fine grained, slaty looking tufa is illustrated in Fig. 24. They resemble spearpoints, yet may have been devoted to a wholly different use. They are long, leaf-like flakes, triangular in section, slightly worked down by flaking, sharpened by grinding at the point, and slightly notched at the top, perhaps for hafting.

Arrowpoints.—The unique character of the arrowpoints of Chiriqui is already known to archæologists. The most striking feature is the triangular section presented in nearly all cases and shown in the figures (Fig. 25). The workmanship is extremely rude. The

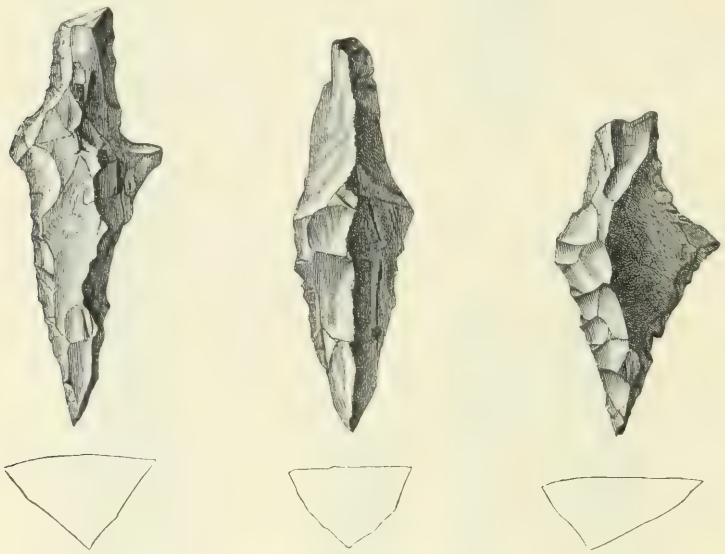


FIG. 25. Arrowpoints of jasper—½.

material is generally a flinty jasper of reddish and yellowish hues. The number found is comparatively small. The specimens given are of average size.

Ornaments.—It would seem from a study of our collections that ornaments of stone were seldom used by the inhabitants of Chiriqui. There are a few medium sized beads of agate and one pendant of dark greenish stone rudely shaped to resemble a human head. Ornaments of gold and copper were evidently much preferred.

METAL.

GOLD AND COPPER.

The Chiriquians, like many of their neighbors in the tropical portions of the American continent, were skilled in the working of metals. Gold, silver, copper, and tin—the last in alloys with copper forming bronze—are found in the graves. Gold is the most important, and is associated with all the others in alloys or as a surface coating. The inhabitants of the isthmus at the time of the discovery were rich in objects, chiefly ornaments, of this metal, and expeditions sent out under Balboa, Pizarro, and others plundered the natives without mercy. When the Indian village of Darien was captured by Balboa (1510) he obtained "plates of gold, such as they hang on their breasts and other parts, and other things, all of them amounting to ten thousand pesos of fine gold."[1] From an expedition to Nicaragua the same adventurers brought back to Panama the value of "112,524 pieces of eight in low gold, and 145 in pearls."[2] Early Spanish-American history abounds in stories of this kind. Among others we read that Columbus found the natives along the Atlantic coast of Chiriqui and Veragua so rich in objects of gold that he named the district *Castillo del Oro.* It is said that the illusory stories of an *El Dorado* somewhere within the continent of South America arose from the lavish use of gold ornaments by the natives whom the Spaniards encountered, and that Costa Rica gets its name from the same circumstance. It is also recorded that the natives of various parts of Central and South America at the date of the conquest were in the habit of opening ancient graves for the purpose of securing mortuary trinkets. The whites have followed their example with the greatest eagerness. As far back as 1642 the Spaniards passed a law claiming all the gold found in the burial places of Spanish America,[3] the whole matter being treated merely as a means of revenue.

The objects of gold for which the tombs of Chiriqui are justly famous are generally believed to have been simple personal ornaments, the jewelry of the primeval inhabitants, although it is highly probable that many of the figures, at least as originally employed, had an emblematic meaning. They were doubtless at all times regarded as possessed of potent charms, and thus capable of protecting and forwarding the interests of their owners. They have been found in great numbers within the last twenty-five years, but for the most part, even at this late date, have been esteemed for their money value only. Very many specimens found their way to this country, where they were either sold for curiosities or, after waiting long for a purchaser, even in the very shadow of our museums, were consigned to the melt-

[1] Herrera: Hist. America, Vol. VI, p. 369.

[2] Herrera: Hist. America, Vol. III, p. 287.

[3] Mr. Hawes's letter answering questions about Chiriqui, read by Mr. Davis before the American Ethnological Society, April 17, 1860.

ing pot. Many stories bearing upon this point have been told me. A Washington jeweler is represented as having exhibited in his window on Pennsylvania avenue about the year 1860 a remarkable series of these trinkets, most of which were afterwards sent to New York to be melted. About the same period a gentleman on entering a shop in San Francisco was accosted by a stranger who had his pockets well filled with these curious relics and wished to dispose of them for cash. A number of my acquaintances have neat but grotesque examples of these little images of gold attached to their watch guards, thus approving the taste of our prehistoric countrymen and at the same time demonstrating the identity of ideas of personal embellishment in all times and with all peoples.

The ornaments are found only in a small percentage of the graves, those probably of persons sufficiently opulent to possess them in life; a majority of the graves contain none whatever. They are often found at the bottom of the pits, and probably in nearly the position occupied by them while still attached to the persons of the dead. It is said that occasionally they are found in niches at the sides of the graves, as if placed during the filling of the pit.

Strangely enough, the gold is very generally alloyed with copper, the composite metal ranging from pure gold to pure copper. A small percentage of silver is also present in some of the specimens examined, but this is probably a natural alloy. In a few cases very simple figures appear to have been shaped from nuggets or masses of the native metals; this, however, is not susceptible of proof. The work is very skillfully done, so that we find it difficult to ascertain the precise methods of manipulation. The general effect in the more pretentious pieces resembles that of our filigree work, in which the parts are produced by hammering and united by soldering; yet there are many evidences of casting, and these must be considered with care. As a rule simple figures and some portions of composite figures present very decided indications of having been cast in molds, yet no traces of these molds have come to light, and there are none of those characteristic markings which result from the use of composite or "piece" molds. Wire was extensively used in the formation of details of anatomy and embellishment, and its presence does not at first seem compatible with ordinary casting. This wire, or pseudo-wire it may be, is generally about one-twenty-fifth of an inch in diameter.

The manner in which the numerous parts or sections of complex figures are joined together is both interesting and perplexing. Evidences of the use of solder have been looked for in vain, and if such a medium was ever used it was identical in kind with the body of the object or so small in quantity as to escape detection. At the junction of the parts there are often decided indications of hammering, or at least of the strong pressure of an implement; but in pur-

suing the matter further we find a singular perfection in the joining, which amounts to a coalescence of the metals of the two parts concerned. There is no weakness or tendency to part along the contact surfaces, neither is there anything like the parting of parallel wires in coils or where a series of wires is joined side by side and carried through various convolutions. In a number of cases I made sections of coils and parts composed of a number of wires, in the hope of discovering evidences of the individuality of the strands, but the metal in the section is always homogeneous, breaking with a rough, granular fracture, and not more readily along apparent lines of junction than across them; and further, in studying in detail the surface of parts unpolished or protected from wear by handling, we find everywhere the granular and pitted unevenness characteristic of cast surfaces. This is true of the wire forms as well as of the massive parts, and, in addition to this, such defects occur in the wires as would hardly be possible if they were of wrought gold.

All points considered, I am inclined to believe that the objects were cast, and cast in their entirety. It is plain, however, that the original model was made up of separately constructed parts of wire or wire-like strands and of eccentric and often rather massive parts, and that all were set together by the assistance of pressure, the indications being that the material used was sufficiently plastic to be worked after the manner of clay, dough, or wax. In one case, for example, the body of a serpent, consisting of two wires neatly twisted together, is held in the hand of a grotesque figure. The hand consists of four fingers made by doubling together two short pieces of wire. The coil has been laid across the hand and pressed down into it until half buried, and the ends of the fingers are drawn up around it without any indication of hammer strokes. Indeed, the effect is just such as would have been produced if the artist had worked in wax. Again, in the modeling of the eyes we have a good illustration. The eye is a minute ball cleft across the entire diameter by a sharp implement, thus giving the effect of the parted lids. Now, if the material had been gold or copper, as in the specimens, the ball would have been separated into two parts or hemispheres, which would not exhibit any great distortion; but as we see them here the parts are flattened and much drawn out by the pressure of the cutting edge, just as if the material had been decidedly plastic.

It seems to me that the processes of manufacture must have been analogous to those employed by the more primitive metal workers of our own day. In Oriental countries delicate objects of bronze and other metals are made as follows: A model is constructed in some such material as wax or resin and over it are placed coatings of clay or other substance capable of standing great heat. These coatings, when sufficiently thickened and properly dried, form the mold, from which the original model is extracted by means of heat. The fused

metal is afterwards poured in. As a matter of course, both the mold and the model are destroyed in each case, and exact duplications are not to be expected. Mr. George F. Kunz, of New York, with whom I have discussed this matter, states that he has seen live objects, such as insects, used as models in this way. Being coated with washes of clay or like substance until well protected and then heavily covered, they were placed in the furnace. The animal matter was thus reduced to ashes and extracted through small openings made for the purpose.

As bearing upon this subject it should be mentioned that occasionally small figures in a fine reddish resin are obtained from the graves of Chiriqui. They are identical in style of modeling with the objects of gold and copper obtained from the same source.

In discussing possible processes, Mr. William Hallock, of the division of chemistry and physics of the United States Geological Survey, suggested that if the various sections of a metal ornament were embedded in the surface of a mass of fire clay in their proper relations and contacts they could then be completely inclosed in the mass and subjected to heat until the metal melted and ran together. After cooling, the complete figure could be removed by breaking up the clay matrix. I imagine that in such work much difficulty would be experienced in securing proper contact and adjustment of parts of complex figures. It will likewise be observed that evidences of plasticity in the modeling material would not exist. I must not pass a suggestion of Nadaillac[1] which offers a possible solution of the problem of manipulation. Referring to a statement of the early Spanish explorers that smelting was unknown to the inhabitants of Peru, he states that it would be possible for a people in a low state of culture to discover that an amalgam of gold with mercury is quite plastic, and that after a figure is modeled in this composite metal the mercury may be dissipated by heat, leaving the form in gold, which then needs only to be polished. There is, however, no evidence whatever that these people had any knowledge of mercury.

There is no indication of carving or engraving in the Chiriquian work. In finishing, some of the extremities seem to have been shaped by hammering. This was a mere flattening out of the feet or parts of the accessories, which required no particular skill and could have been accomplished with comparatively rude stone hammers. It is a remarkable fact that many, if not most, of the objects appear to be either plated or washed with pure gold, the body or foundation being of base gold or of nearly pure copper. This fact, coupled with that of the association of objects of bronze with the relics, leads us to inquire carefully into the possibilities of European influence or agency. I observe that recent writers do not seem to have questioned the genuineness of the objects described by them, but that at the same time no mention is made of the plating or washing. This latter circumstance

[1] Nadaillac: Prehistoric America, p. 450.

leads to the inference that pieces now in my possession exhibiting this phenomenon may have been tampered with by the whites. In this connection attention should be called to the fact that history is not silent on the matter of plating. The Indians of New Granada are said to have been not only marvelously skillful in the manipulation of metals, but, according to Bollaert, Acosta declares that these peoples had much *gilt* copper, "and the copper was gilt by the use of the juice of a plant rubbed over it, then put into the fire, when it took the gold color."[1] Just what this means we cannot readily determine, but we safely conclude that, whatever the process hinted at in these words, a thin surface deposit of pure gold, or the close semblance of it, was actually obtained. It is not impossible that an acid may have been applied which tended to destroy the copper of the alloy, leaving a deposit of gold upon the surface, which could afterwards be burnished down.

It has been suggested to me that possibly the film of gold may in cases be the result of simple decay on the part of the copper of the alloy, the gold remaining as a shell upon the surface of the still undecayed portion of the composite metal; but the surface in such a case would not be burnished, whereas the show surfaces of the specimens recovered are in all cases neatly polished.

If we should conclude that the ancient Americans were probably able to secure in some such manner a thin film of gold, it still remains to inquire whether there may not have been some purely mechanical means of plating. In some of the Chiriquian specimens a foundation of very base metal appears to have been plated with heavy sheet gold, which as the copper decays comes off in flakes. Occasional pieces have a blistered look as a consequence. Were these people able with their rude appliances to beat gold into very thin leaves? and Had they discovered processes by which these could be applied to the surfaces of objects of metal? are questions that should probably be answered in the affirmative.

The flakes in some cases indicate a very great degree of thinness. Specimens of sheet gold ornaments found in the tombs are thicker, but are sufficiently thin to indicate that, if actually made by these people, almost any degree of thinness could be attained by them. It would probably not be difficult to apply thin sheet gold to the comparatively smooth surfaces of these ornaments and to fix it by burnishing.

Mr. Kunz suggests still another method by means of which plating could have been accomplished. If a figure in wax were coated with sheet gold and then incased in a clay matrix, the wax could be melted out, leaving the shell of gold within. The cavity could then be filled with alloy, the clay could be removed, and the gold, which would adhere to the metal, could then be properly burnished down.

[1] Bollaert: Ethnological and Other Researches in New Granada, &c.

It will be seen from this hasty review that, although we may conclude that casting and plating were certainly practiced by these peoples, we must remain in ignorance of the precise methods employed.

Referring to the question of the authenticity of the specimens themselves, I may note that observations bearing upon the actual discovery of particular specimens in the tombs are unfortunately lacking. Mr. McNiel acknowledges that with all his experience in the work of excavation no single piece has been taken from the ground with his own hands, and he cannot say that he ever witnessed the exhumation by others, although he has been present when they were brought up from the pits. Generally the workmen secrete them and afterwards offer them for sale. He has, however, no shadow of a doubt that all the pieces procured by him came from the graves as reported by his collectors. The question of the authenticity of the gilding will not be satisfactorily or finally settled until some responsible collector shall have taken the gilded objects with his own hands from their undisturbed places in tombs known to be of pre-Columbian construction.

There are many proofs, however, of the authenticity of the objects themselves. It is asserted by a number of early writers that the American natives were, on the arrival of the Spaniards, highly accomplished in metallurgy; that they worked with blowpipes and cast in molds; that the objects produced exhibited a high order of skill; and that the native talent was directed with unusual force and uniformity toward the imitation of life forms. It is said that the conquerors were "struck with wonder" at their skill in this last respect. And a strong argument in favor of the genuineness of these objects is found in the fact that it is not at all probable that rich alloys of gold would have been used by Europeans for the base or foundation when copper or bronze, or even lead, would have served as well. We also observe that there is absolutely no trace of peculiarly European material or methods of manipulation, a condition hardly possible if the extensive reproductions were made by the whites. Neither are there traces of European ideas embodied in the shapes or in the decoration of the objects — a circumstance that argues strongly in favor of native origin. An equally convincing argument is found in the fact that all the alloys liable to corrosion exhibit marked evidences of decay, as if for a long period subject to the destructive agents of the soil. In many cases the copper alloy base crumbles into black powder, leaving only the flakes of the plating. Lastly and most important, the strange creatures represented are in many cases identical with those embodied in clay and in stone, and for these latter works no one will for a moment claim a foreign derivation.

Considering all these arguments, I arrive at the conclusion that the ornaments are, in the main, genuine antiquities, and that, if any deception at all has been practiced, it is to be laid at the door of modern

goldsmiths and speculators, who, according to Mr. McNiel, are known in a few cases to have "doctored" alloyed objects with washes of gold with the view of selling them as pure gold.

I present the following specimens with a reasonable degree of confidence that all, or nearly all, are of purely American fabrication, and I sincerely hope that at no distant day competent archæologists may have the opportunity of making personal observations of similar relics in place.

The objects consist to a great extent of representations of life forms, in many cases more fanciful than real and often extremely grotesque. They include the human figure and a great variety of birds and beasts indigenous to the country, in styles resembling work in clay and stone of the same region. My illustrations show the actual sizes of the objects.

The human figure.—Statuettes of men and women and of a variety of anthropomorphic figures of all degrees of elaboration abound. Fig. 26 illustrates a plain, rude specimen belonging to the collection of

FIG. 26. Human figure with ridged crown, formed of copper-gold alloy.

J. B. Stearns. It was obtained by Mr. McNiel from near the south base of Mount Chiriqui. The body is solid and the surface is rough and pitted, as if from decay. In many respects it resembles the stone sculptures of the isthmus. The metal is nearly pure copper. A piece exhibiting more elaborate workmanship, illustrated by Bollaert,[1] is shown in Fig. 27. Another remarkable specimen is illustrated by De Zeltner, but the photograph published with his brochure is too indistinct to permit of satisfactory reproduction. He describes it in the following language:

The most curious piece in my collection is a gold figure of a man, 7 centimeters in height. The head is ornamented with a diadem terminated on each side with the head of a frog. The body is nude, except a girdle, also in the form of a plait, supporting a flat piece intended to cover the privates, and two round ornaments on

[1] Bollaert: Antiquarian Researches in New Granada, plate facing p. 31.

each side. The arms are extended from the body ; the well drawn hands hold, one of them a short, round club, the other a musical instrument, of which one end is in the mouth and the other forms an enlargement like that of a flute. made of human

FIG. 27. Grotesque human figure in gold, from Bollaert.

bone. It is not probable that this is a pipe. Both thighs have an enlargement, and the toes are not marked in this little figurine.[1]

FIG. 28. Rudely shaped and finished human figure in gold.

In Fig. 28 we have a rather rudely made and finished piece collected

[1]A. De Zeltner : Notes sur les sépultures indiennes du département de Chiriqui.

by Mr. McNiel, and now owned by Mr. Stearns. It exhibits features corresponding with a number of those referred to by De Zeltner. The foundation is thin and is of base metal coated with pure gold. I present two additional examples of the human figure from the collection of Mr. Stearns. One of them (Fig. 29) is an interesting little

FIG. 29. Grotesque human figure in nearly pure copper, partially coated with yellow gold.

statuette in dark copper that still retains traces of the former gilding of yellow gold. The crown is flat and is surrounded by a fillet of twisted wire. The face is grotesque, the nose being bulbous, the mouth large, and the lips protruding. The hands are represented as grasping cords of wire which connect the waist with the crown of the figure and seem to be intended for the bodies of serpents, the heads of which project from the sides of the headdress. Similar serpents project from the ankles. The feet are flattened out as if intended to be set in a crevice. The extremities — excepting the feet — and the ornaments are all formed of wire. The various parts of the figure have been modeled separately and set together while the ma-

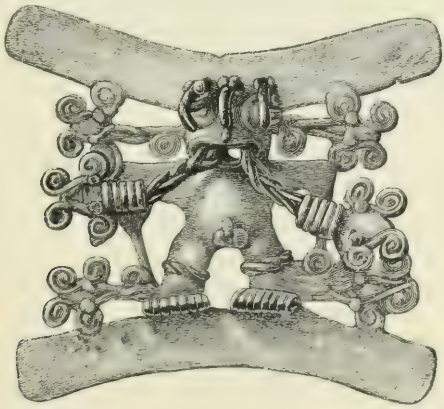


FIG. 30. Grotesque human figure in nearly pure gold.

terial was in a plastic or semiplastic condition. This is clearly indicated by the sinking of one part into another at the points of contact.

An excellent example of the more elaborate figures is shown in Fig. 30. It is of reddish gold, slightly alloyed apparently with copper, and has in finishing received a very thin wash or plating of yellow gold, which is worn off in exposed parts. The central feature of the rather complicated structure is a grotesque human figure, much like the preceding, and having counterparts in both clay and stone. The figure is backed up and strengthened by two curved and flattened bars of gold, one above and the other below, as seen in the cut. The figure is decked with and almost hidden by a profusion of curious details, executed for the most part in wire and representing serpents and birds. Three vulture-like heads project from the crown and overhang the face. Two serpents, the bodies of which are formed of plaited wire, issue from the mouth of the figure and are held about the neck by the hands. The heads of the serpents are formed of wire folded in triangular form and are supplied with double coils of wire at the sides, as if for ears, and with little balls of gold for eyes. Similar heads project from the sides of the head and from the feet of the image.

The peculiarities of construction are seen to good advantage in this specimen. The figure is made up of a great number of separate pieces, united apparently by pressure or by hammering while the material was somewhat plastic. Upwards of eighty pieces can be counted. The larger pieces, forming the body and limbs, are hollow or concave behind. Nearly all the subordinate parts are constructed of wire.

The bird.—Images of birds are numerous and vary greatly in size and elaboration. They are usually represented with expanded wings and tails, the under side of the body being finished for show. The back is left concave and rough, as when cast, and is supplied with a ring for suspension or attachment, as seen in the profile view (Fig. 31). The owl, the eagle, the parrot, and various other birds are recognized, although determinations of varieties are not possible, as in many cases the forms are rude or greatly obscured by extraneous

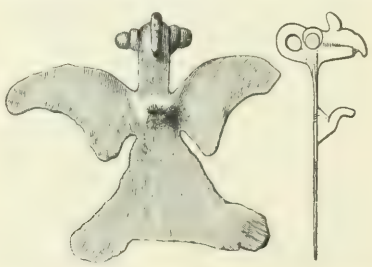


FIG. 31. Rudely executed image of a bird in gold.

details. The example shown in Fig. 31 is of the simplest type and the rudest workmanship, and is apparently intended for some rapacious species, possibly a vulture. The body, wings, and tail are

hammered quite thin and are left frayed and uneven on the edges. The material appears to be nearly pure copper plated with yellow gold. Specimens of this class are very numerous. One, presented in a publication of the Society of Northern Antiquaries, and now in the museum at Copenhagen, is thought to be intended for a fish hawk, as it carries a fish in its mouth. De Zeltner mentions a statuette in gold of a paroquet, whose head is ornamented with two winged tufts. Such a specimen may be seen in the collection of Mr. Stearns.

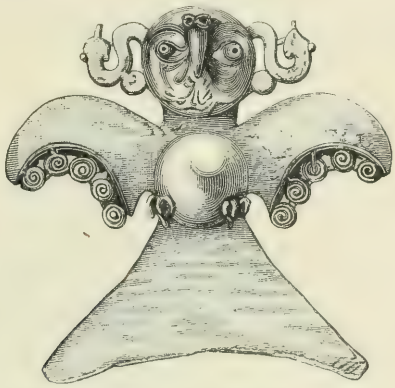


FIG. 32. Image of a bird in gold, from Bollaert.

Fig. 32 is reproduced from Bollaert. It represents a parrot and is very elaborately worked.

The puma.—Representations of quadrupeds are common; a good example, copied from Bollaert, is given in Fig. 33. The animal in-

FIG. 33. Puma shaped figure in gold.

tended is apparently a puma, a favorite subject with Chiriquian workers in clay and stone as well as in gold. The body is hollow and open beneath and the fore feet are finished with loops for suspen-

FIG. 34. Puma shaped figure in base metal.

sion. A similar piece with head thrown back over the body is shown in Fig. 34. The metal in this case appears to be nearly pure copper.

Grotesque figure.—Another piece collected by Mr. McNiel is outlined in Fig. 35. The metal is quite base and the surface has been

FIG. 35. Quadruped with grotesque face in base metal.

coated with gold, which is now nearly all rubbed off. The shape is that of a quadruped. The face has a rather grotesque, not to say satanic, expression. The details are not unlike those of other examples previously given.

The fish.—The fish was a favorite subject with the ancient nations of South America, and is modeled in clay, woven into fabrics, and worked in metals with remarkable freedom. It was in great favor in Chiriqui and must have been of importance in the mythology of the country. It occurs most frequently in pottery, where it is executed in color and modeled in the round. The very grotesque specimen in gold shown in Fig. 36 is copied from Harper's Weekly of August 6,

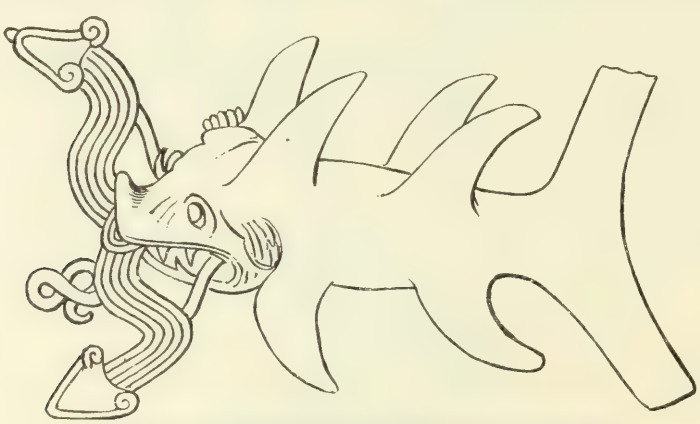


FIG. 36. Figure of a fish in gold. From Harper's Weekly, 1859.

1859, where it forms one of a number of illustrations of these curious ornaments. The paper is, I believe, by Dr. F. M. Otis, who had just returned from Panama. A very curious piece owned by Mrs. Philip Phillips, of Washington, represents a creature having some analogies

with the fish figure of Otis. Issuing from the mouth is the same forked tongue, each part terminating in a serpent's head. The body is about two inches long and the back has five triangular perforations. The tail is forked and the four leg-like members terminate in conventional serpents' heads. The metal is pure or nearly pure gold.

The frog.—The frog appears in the plastic art of Chiriqui more frequently perhaps than any other reptile. Its form is reproduced with much spirit and in greatly varying sizes, degrees of elaboration, and styles of presentation. It is probable that a number of species are represented. In Fig. 37 we have a large, rather plain specimen, now

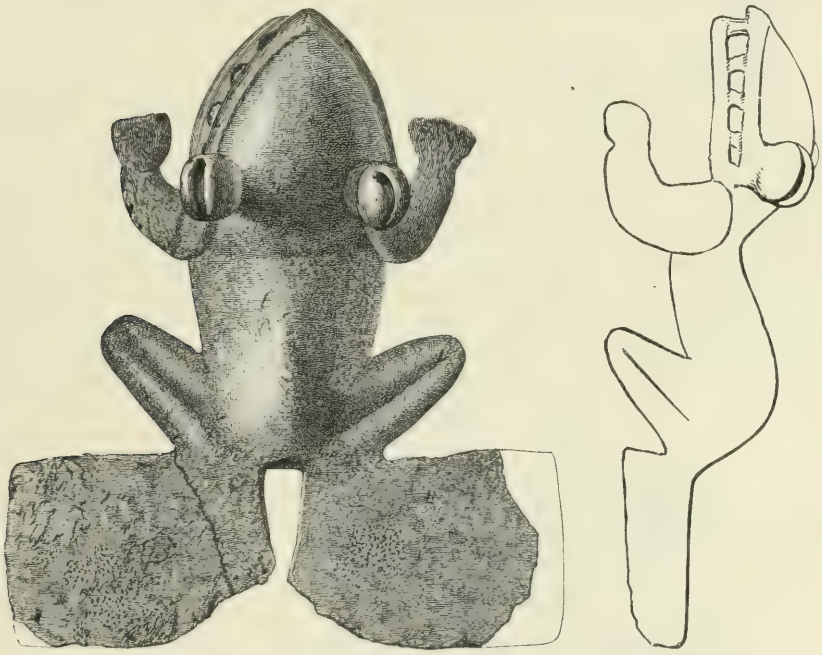


FIG. 37. Large figure of a frog in base metal plated with gold.

in the National Museum. The body and limbs are concave beneath, the metal being about one-sixteenth of an inch thick. Teeth are

FIG. 38. Small figure of a frog, in base metal plated with gold.

suggested by a number of perforations encircling the jaws and the eyes are minute hawk bells containing pellets of metal. The legs are

placed in characteristic positions, and the hind feet are broad plates without indications of toes, a characteristic of these golden frogs. The framework or foundation is of copper, apparently nearly pure, and the surface is plated with thin sheet gold, which tends to flake off as the copper foundation corrodes.

The minute, delicately finished example given in Fig. 38 contrasts strongly with the preceding. It is also of base metal plated with pure gold and belongs to the collection of Mr. Stearns.

The alligator.—The alligator, which appears so frequently in the pottery of Chiriqui, is only occasionally found in gold. A striking

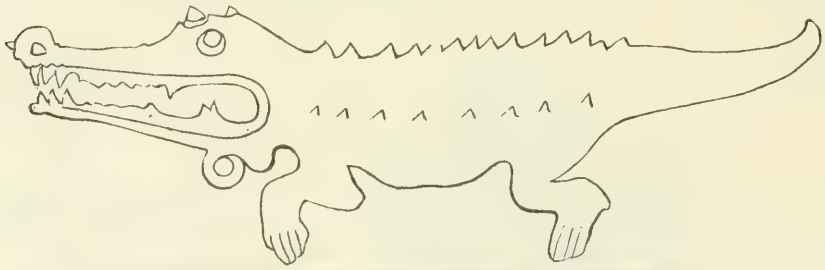


FIG. 39. Figure of an alligator, in gold, published in Harper's Weekly, 1859.

specimen, illustrated in Harper's Weekly of August 6, 1859, is given in Fig. 39. A similar piece, formed of base metal, is in the collection of Mr. Stearns.

The crayfish (?).—In Fig. 40 we have a fine specimen, intended ap-

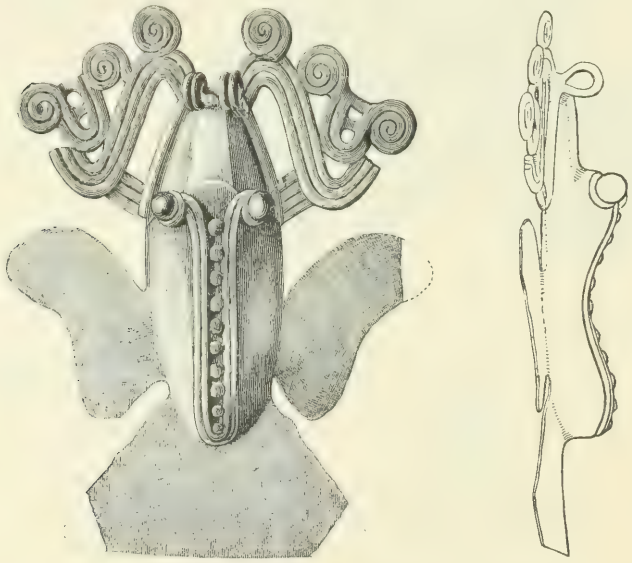


FIG. 40. Animal figure, in base metal plated with gold.

parently to represent a crayfish or some similar crustacean form. The head is supplied with complicated yet graceful antenna-like append-

ages, made of wire neatly coiled and welded together by pressure or hammering. The eyes are globular and are encircled by the ends of a double loop of wire which extends along the back and incloses a line of minute balls or nodes. The peculiar wings and tail will be best understood by referring to the illustration. The foundation metal is much corroded, being dark and rotten, and the plating of reddish gold seems to have been coated with a thin film of yellow gold. The profile view gives a good idea of the thickness of the metal and of the relief of the parts. Two rings or loops of doubled wire are attached to the extreme end of the nose and a heavy ring for suspending is fixed to the under side of the head.

Miscellaneous.—Gold, pure and in the usual alloys, was also used in the manufacture of other articles, such as bells, beads, disks, balls, rings, whistles, thimble shaped objects, and amulets of varied shapes. Bells are more generally made of bronze, because, perhaps, of its greater degree of resonance. Thin plates, or rather circular sheets, of gold leaf are numerous. One mentioned by Bollaert was $7\frac{1}{4}$ inches in diameter. They are plain or crimped about the margins, indented in various ways, and sometimes perforated, apparently for suspension or attachment. Merritt mentions examples having holes which showed evidences of wear upon one side only, indicating attachment in a fixed position to some object or to some part of the costume. But one example is at hand, a thin sheet, three inches in diameter and crimped or indented neatly about the margin. Its thickness is about that of ordinary tinfoil.

BRONZE.

Bells.—Bells seem to have been in pretty general use by the more cultured American races previous to the conquest. The form best known is the hawk bell, or common sleighbell of the North. The globular body is suspended by a loop at the top and is slit on the under side, so that the tinkling of the small free pellets of metal may be audible. Such bells are found in considerable numbers in the graves of Chiriqui, although I have no positive assurance that any of the examples in my possession were actually taken from graves which contained typical Chiriquian relics of other classes. The specimens now in the National Museum (Fig. 41) are in most cases, if not in all, of bronze, as determined by Mr. R. B. Riggs, of the chemical laboratory of the United States Geological Survey. All have been cast in molds. In most cases there are traces of a plating of gold. The largest is $1\frac{1}{4}$ inches in height and three-fourths of an inch in diameter. It is surmounted by the rude figure of an animal, through or beneath the body of which is an opening for the attachment of a cord. Others have simple loops at the top. The small perforated specimen belongs to Mr. Stearns. The additional piece given in Fig. 42 is unique in conception. It represents a human head, which takes an inverted position

when the bell is suspended. The lower part of the bell forms a conical crown to the head and the ring of suspension is attached to the chin. Double coils of wire take the place of the ears, and the

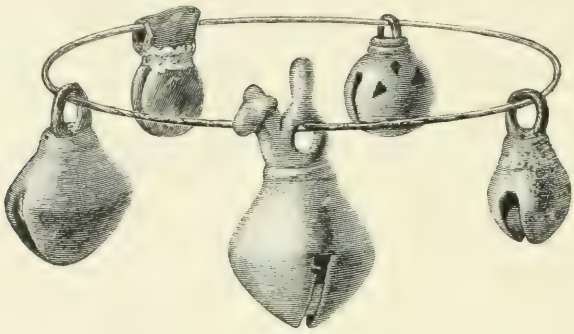


FIG. 41. Bronze bells plated or washed with gold.

other features are formed by setting on bits of the material used in modeling. This specimen belongs to the collection of Mr. Stearns. Many examples of more elaborate workmanship have been recovered from the tombs and are now to be found in the collections of America and Europe.

FIG. 42. Bronze bell with human features.

A specimen found many years ago on the Rio Grande, near Panama, and figured in Harper's Weekly, was of gold and showed specific variations from the Chiriquian pieces. It will be seen by reference to the outline given in Fig. 43 that three very neatly shaped and gracefully ornamented bells are mounted upon a circular plate to which a short handle is attached. It was evidently not intended for suspension, but rather to be held in the hand as a rattle.

A question as to the authenticity of these bells as aboriginal works very naturally arises, and it may be difficult to show to the satisfaction of the skeptical mind that any particular specimen is not of European origin or inspiration. At the same time we are not without strong evidences that such bells were in use by the Americans before the advent of the whites. Historical accounts are not wanting, but I shall only stop to point out some of the internal evidences of the native art. The strongest argument is to be found in the presence

of analogous features in other branches of the art and in other arts. The eyes of the golden figures of reptiles are in many cases minute hawk bells, and in works of clay, the purely aboriginal character of which has not been called in question, similar features are discov-

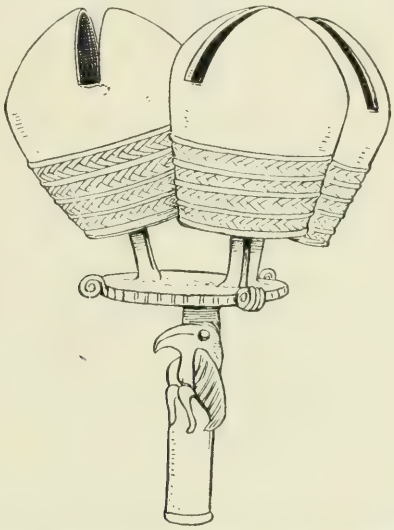


FIG. 43. Triple bell or rattle found on the Rio Grande.

ered. The American origin of the bell, therefore, is not to be questioned. The form originated, no doubt, in the rattle, at first a nutshell or a gourd; later it was modeled in clay, and in time the same idea was worked out in the legs and the ornaments of vessels and in the heads and other parts of animal forms, which were made hollow and supplied with tinkling pellets. With the acknowledged skill of these people in the working of metals, there is no reason why the bells de-

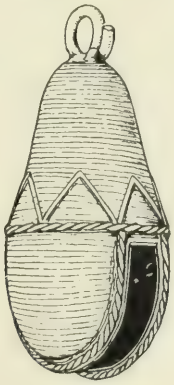


FIG. 44. Ancient Mexican bell.

scribed should not have been manufactured independently of European aid and influence, provided the requisite metal was at hand.

It should be observed that if these early American bells were copied from or based upon Spanish originals they would not probably vary greatly in type with the various sections from which they are recovered, but it is observed that marked and persistent differences do occur. The well known Mexican bell, an example of which is outlined in Fig. 44, although of bronze, is generically distinct in form and construction.

In a brief review I may recall the more salient points regarding the use of metals in ancient Chiriqui. Gold, silver, copper, and apparently tin are represented.

Gold and copper were very plentifully distributed among the isthmian races, but we have little information as to the sources of supply. Free gold is found in the stream beds of many localities, and copper was probably found in its native state in some convenient locality; yet it is not impossible that these metals were transported from distant regions, as the inhabitants of Chiriqui must have had considerable intercourse with those of Central America on the north and with those of Granada on the south. Silver and tin are found in alloys with gold and copper, but not as independent metals. The silver gold alloy is probably a natural compound. In no case have I found silver to exceed 6 per cent. of the composite metal. Tin was artificially alloyed with copper, forming bronze. The latter metal resembles our ordinary bronze in color and hardness, but I am unable to secure more than a qualitative analysis on account of the scarcity of specimens available for the purpose. We have no information in regard to the origin of the tin. It is not found in a native state, and since it seems hardly probable that the Chiriquians understood smelting ores we are left in doubt as to whether it was obtained from more cultured nations to the north or to the south or from transoceanic countries.

The gold-copper alloys appear to range between pure gold and pure copper. If the bronze is of European origin, then we must conclude that all objects made of that metal are of post-Columbian manufacture. This question will probably be definitely settled in the near future.

The greater number of the objects were formed by casting in molds. Hammering was but little practiced, excepting, apparently, in the formation of sheet gold, which was probably an indigenous product. Repoussé work is not found, save as represented in the crimping and indenting of gold leaf. Engraving and carving were not practiced. It may be considered certain that gilding, or at least plating, was understood.

The objects are obtained from ancient graves of which no record or reliable tradition is preserved. They are all ornaments, no coin, weapon, tool, or utensil having come to my notice. The absence of

utensils and of hammered objects of any kind strikes me as being rather extraordinary, since it is popularly supposed that, in the normal succession of events, hammering should precede casting and that utensils should be made before elaborate ornaments.

The work exhibits close analogies with that of the mainland of South America, but these analogies appear to be in material, treatment, and scope of employment rather than in the subject matter of the conceptions. The personages and zoömorphic characters represented are characteristically Chiriquian, and were derived no doubt from the mythology of the locality. These works affiliate with the various works in stone and clay, the art products of the province thus constituting a fairly homogeneous whole and being entirely free from traces of European influence.

Metals do not come into use early in the history of a race, as they are not found in shapes or conditions suitable for immediate use, nor are they sufficiently showy when found to be especially desirable for ornaments. A long period must have elapsed before the use of metals was discovered, and a longer period must have passed before they were worked; and, in the light of our knowledge of the ancient tribes of the United States, it would seem that a considerable degree of culture may be achieved before the casting of metals is understood; but in the ordinary course of progress the discovery of methods of alloying rare metals would be far separated from that of the simple fusing and casting of a single metal, such as gold. The Chiriquian peoples not only had a knowledge of the methods of alloying gold with copper, and, apparently, copper with tin, but, if our data are correct, they were able to plate the baser metals and alloys with sheet gold, and, what is far more wonderful, to wash them with gold, producing an effect identical with that of our galvanic processes.

The character of the conceptions embodied in the art unite with evidences of technical skill to prove to us that American culture, as represented by the metal ornaments of Chiriqui, was not the product of a day, but of long periods of experiment and progress.

POTTERY.

Preliminary.—The importance of the potter's art to archæology has often been pointed out. Baked clay is one of the most enduring materials utilized in art, and its employment by the races of men has fallen but little short of universal. The creations of that noblest of arts, architecture, and the antecedent forms of house building are necessarily left where erected, to be fed upon by the remorseless elements of nature, but the less pretentious utensil of clay accompanies its owner to the tomb, where it remains practically unchanged for ages.

Many glimpses of the early history of the American races and of

the progress of art in pre-Columbian times are obtained through these exhumed relics, and in no case have we a view more clear and comprehensive than that furnished in the series here presented. The graves of Chiriqui have yielded to a single explorer upwards of 10,000 pieces of pottery, and this chiefly from an area perhaps not more than fifty miles square. These vessels constitute at least 90 per cent. of the known art of the ancient occupants of the province, and, although not so eloquent of the past as are the inscribed tablets of Assyria or the pictured vases of Greece, they tell a story of art and of peoples that without their aid would remain untold to the end of time.

A careful study of the earthenware of this province leads to the conclusion that for America it represents a very high stage of development, and its history is therefore full of interest to the student of art. Its advanced development as compared with other American fictile products is shown in the perfection of its technique, in the high specialization of form, and in its conventional use of a wide range of decorative motives. There is no family of American ware that bears evidence of higher skill in the manipulation of clay or that indicates a more subtile appreciation of beauty of form, and no other that presents so many marked analogies to the classic forms of the Mediterranean. Strangely enough, too, notwithstanding the well established fact that only primitive methods of manufacture were known, there is a parallelism with wheel made ware that cannot but strike the student with amazement.

In speaking thus of the whole body of ceramic products, I would not convey the impression that there is perfect homogeneity throughout, as if all were the work of a single people developed from within, and therefore free from the eccentricities that come from exotic influence. On the contrary, there is strong evidence of mixed conditions of races and of arts, the analysis of which, with our present imperfect data, will be extremely difficult. These evidences of mixed conditions are found in the marked diversity and individuality of character of the various groups of ware.

It is impossible, without the aid of careful observations in the field, to arrive at any conclusion as to the relative age of the different varieties of ware. Appearances of age are deceptive; the newer looking varieties may be the older and those executed in the most primitive style may belong to the later period, for grades in culture are not chronologic.

With reference to the principal groups of relics, we cannot do better than accept the statements of collectors that all are buried in like ways and in similar tombs, different varieties in many cases occurring in the same tomb. There are, however, in a few minor groups such marked distinctions in workmanship and style that we are compelled to attribute them to different periods or to distinct communities.

The groups separated most completely from others are the scarified pottery presented first in the series of painted wares, the maroon group, which follows, and other varieties represented by fugitive pieces. The latter may have reached Chiriqui from neighboring provinces. There are certain pieces that speak decidedly of Costa Rican influence and others that find their counterparts in the Colombian states to the south.

In art in clay in most countries the vessel is the leading idea, the center about which nearly the entire ceramic art is gathered. This is true in a marked degree in Chiriqui, and vessels are therefore given the first place in this paper. The less usual forms include drums, whistles, rattles, stools, spindle whorls, needlecases, and toy-like images, all of which present features of peculiar interest. These classes of objects are discussed in separate sections.

There are few indications of an ambition to model natural forms or mythologic figures independently of utensils and useful objects, and, strange to say, no pieces are found that portray the human face and figure with even a fair degree of approach to nature.

How found.—In describing the graves and tombs in a previous section, I alluded to the manner in which the pottery was deposited. It appears to have been buried with the dead or thrown into the grave with the earth and stones with which the pit was filled. There was little regularity in the place or position of the vessels and many were broken when found. The precise use of the vessels, the character of the contents, or the relation of particular pieces to the remains of the dead cannot be determined. Although the human remains have almost entirely disappeared and there are no traces left of utensils of wood, bone, horn, or shell, the paste, slip, and colors are wonderfully well preserved and the surface is not even discolored by contact with the earth. When found, every crevice and cavity is completely filled with earth, and the paste is often so tender that the vessels have to be dried with great care before they can be handled with freedom. The number of pieces found in a grave sometimes reaches twenty, but the average is perhaps not above three or four.

Material.—The material used in the manufacture of this ware is remarkably uniform throughout the whole province, varying slightly with the locality, with the group, and with the character of the vessel constructed. Generally the paste consists of a matrix of fine clay tempered with finely pulverized sand, in which may be detected grains of quartz, feldspar, hornblende, augite, particles of iron oxide, &c. Argillaceous matter has been sparingly used, the sand in many cases comprising at least 75 per cent. of the mass. Many of the unpainted specimens, from which the polished slip has been removed, give off showers of fine sand when rubbed by the hand, and it is difficult to detect the presence of any finely comminuted matrix whatever. The

thin slip employed in surface finish is more highly argillaceous than the paste. The clay used was probably mostly light in color, as the paste is now quite uniformly so. The baking was effected apparently without a very high degree of temperature and by methods that left few marks or discolorations upon the vessels. In hardness and durability the paste corresponds pretty closely with that of our red porous earthenware. The softer pieces can be scratched or even carved with a knife. Water will penetrate any of these vessels in a few minutes, but decay has probably tended to make the walls more porous.

Manufacture.—There is no piece of this ware that does not bear evidence of a high degree of skill on the part of the potter; and yet, owing to the thorough manner in which the work is finished, the precise methods of manipulation are not easily detected. So great is the symmetry and so graceful are the shapes that one is led to suspect the employment of mechanical devices of a high order. The casual observer would at once arrive at the conclusion that the wheel or molds had been used, but it is impossible to detect the use of any such appliances. We observe that irregular and complex forms, in the production of which mechanical appliances could not be used to advantage, are modeled with as much grace of contour and perfection of surface as are the simpler shapes that could be turned upon a wheel, and we conclude that with this remarkable people the hand and the eye were so highly educated that mechanical aids were not indispensable. I find no evidence that coil building was systematically practiced, but it is clear that parts of complex forms were modeled separately and afterwards united. The various ornaments in relief (the heads and other parts of animals) and the handles, legs, and bases of vessels were constructed separately and then luted on, and with such skill that the thinnest walls and the most complex and delicate forms were not injured in the process. The contact irregularities were then worked down, and every part of the surface, including the more important ornaments, were rendered smooth, preparatory to the application of the thin surface wash or slip. After the slip was applied and the clay became somewhat indurated, the surface was polished with smooth pebbles, the marks of which can be seen on the less accessible parts of the vessel. On the exposed surfaces of certain groups of ware the polish is in many cases so perfect that casual observers and inexperienced persons take it for a glaze. Incised figures and painted decorations were generally executed after the polishing was complete. Details of processes will be given as the various classes of ware pass under review.

The methods of baking were apparently of a higher order than those practiced in many parts of America. One rarely discovers traces of the dark discolorations that result from primitive methods of baking, yet there are none of the contact marks that arise from the furnace firing of Spanish-American potters.

Color.—The colors of the ware and of the surface applications vary decidedly with the different groups. The prevailing colors of the paste may be defined as ranging from very light yellow grays to a variety of ochery yellows and very pale terra cotta reds. In one or two groups there is an approach to salmon and orange hues, and in another the color is black or dark brown. The color within the mass is in some cases darker than upon the surface, an effect produced in baking, and not through the use of different clays. The slip is usually lighter than the surface of the paste.

The colors used in finishing and decorating are confined to reds, blacks, and purple grays. In one large group of ware the appearance of the delineations is such as to lead to the conclusion that the principal pigment or fluid employed in delineation has totally disappeared, carrying with it all underlying colors not of unusual permanence or not worked down with the polishing implement. The Aztec and other races of tropical America used an argillaceous, white pigment in decorating their wares, which has in many cases partially or wholly disappeared, carrying away considerable portions of the colors over which it was laid, while in other cases, and also in this Chiriqui ware, there is no trace of color remaining and we are left to surmise that the brush used probably contained merely a "taking out" medium. Red was profusely used and varies from a light vermilion to a deep maroon. In certain classes of vessels it was hastily daubed on, covering prominent parts of the surface or forming irregular spots, streaks, and rude figures. In two groups of ware it was used as the chief delineating color. In some cases it was employed as a wash or slip and was worked down with the polishing stone, and in this condition it was treated as a ground upon which to execute designs in other colors. It is always a fast color and is probably of mineral character.

The blacks are of two kinds, which are used in distinct groups of ware: one, probably a mineral pigment, somewhat pasty when applied and quite permanent, is always used in delineating the ornamental figures; the other, possibly a vegetable tint, is always used as a ground upon which to execute designs in other mediums. It is confined to a single group of ware. It has in many cases disappeared entirely, and where remaining can be removed with ease by rubbing.

A light purple tint is tastefully and sparingly employed in one group of ware. Browns and other hues occur but rarely and in all cases result from alterations of other colors produced in firing. The color effects of this pottery, although evidently much modified by age, are sufficiently rich to be highly pleasing to the eye.

Use.—The uses to which most classes of earthen products were applied are easily determined. Whistles, drums, rattles, and spindle whorls have definite duties to perform, and vessels, as to general scope of function, answer for themselves: but when we come to inquire

into the particular uses of the various groups of vessels we are often at a loss. The majority of the pieces show no abrasion by handling or discoloration by fire or by contents, and I am inclined to believe that a large portion were taken directly from the furnace and deposited in the tombs. This implies manufacture for purely mortuary purposes.

Two important groups, the high tripods and the two handled cups or pots, are generally discolored by use over fire, but we cannot say with confidence whether that use was a domestic one or whether it was ceremonial. The small size and the elaborate modeling of a majority of the pieces make it appear improbable that they were intended for use in ordinary cooking or even in the preparation of beverages. A few large plain caldrons are found, and these were probably domestic receptacles. All things considered, it would seem highly probable that the greater portion of the vessels exhumed from the graves were intended to be used for religious and mortuary purposes.

The preceding paragraphs refer, for the most part, to the whole body of earthenware products, but throughout the rest of this section I shall treat of vessels only, except in the matter of decoration, which refers equally to all classes of objects.

Forms of vessels.—Divesting the utensil of extraneous features, such as rims, handles, and legs, we have the following series of shapes, which shows a pretty full graduation of outline from extreme to extreme. Beginning with the simplest fundamental form, the shallow cup (Fig. 45, *a*), we ascend gradually to more complex outlines, such as are seen in the hemispherical bowl (*b*), the deep basin with slightly incurved rim (*c*), the globular form (*d*), and the elon-

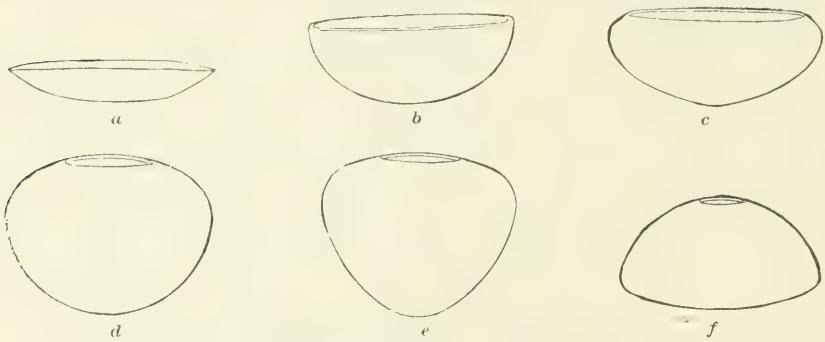


FIG. 45. Fundamental forms of vases—convex outlines.

gated form (*e*). Occasionally we see an eccentric variation, such as is shown in *f*. Flat bottoms are unusual; a conical base is the rule. Outlines do not always exhibit these even, convex curves, but many are straight or concave in profile, as shown in Fig. 46. Complex

forms are shown in Fig. 47, *a* and *b*, and compound forms in Fig. 48, *a* and *b*. Examples of these classes are numerous and important.

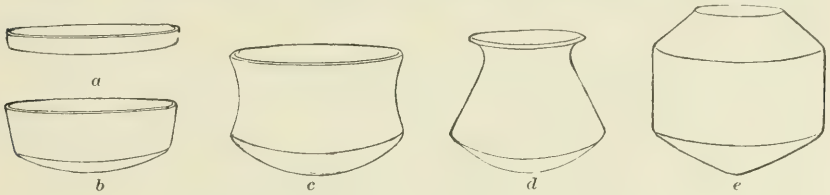


FIG. 46. Fundamental forms of vases—angular outlines.

The compound shapes result from the union of two or more simple forms. Eccentric forms are numerous and result in a majority of cases from the employment of some animal as a model. Thus, if an

FIG. 47. Vases of complex outlines—exceptional forms.

alligator or almost any quadruped is embodied in the vessel, the form tends to become elongated; if a crab or a fish is imitated, there is a tendency to flatness &c. The base is almost universally more or less

FIG. 48. Vases of compound forms.

conical, is rarely flat, and never concave, excepting as the result of the addition of an annular foot or stand. The radical shapes do not

FIG. 49. Square lipped vessel.

undergo any considerable change when rims, necks, handles, legs, and other appendages are added. The rim or lip is in many cases incurved, but as a rule it is turned outward. The margin is plain,

symmetrical, and often considerably thickened. In a few instances the outline is rectangular or scalloped, as shown in Fig. 49, and the attachment of handles often leads to peculiar outlines, as will be seen further on.

The neck in its simplest form is a narrow upright band surrounding the orifice (Fig. 50, *a*) and is not differentiated from the rim. Variations in size and shape are shown in the remaining figures of the series. In *b* it is a narrow constricted band beneath an overhanging rim, in *c* it is upright and considerably elongated, and in *d* it expands, giving a funnel shaped mouth. The exterior surface is very gen-

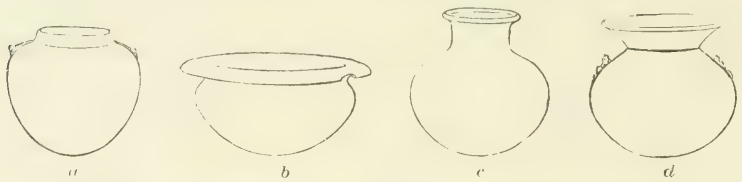


FIG. 50. Variations in the forms of necks and rims — various groups of ware.

erally decorated with relieved or painted devices. High necked bottles and pitcher shaped vessels are unknown.

Handles constitute a very interesting feature of this pottery and are much varied in shape and arrangement. In a few cases the handle

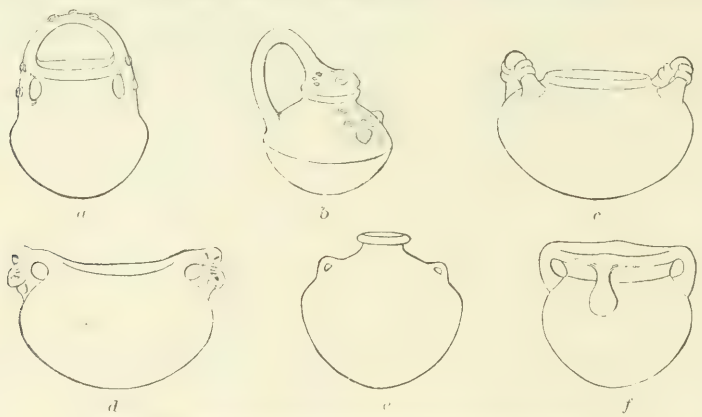


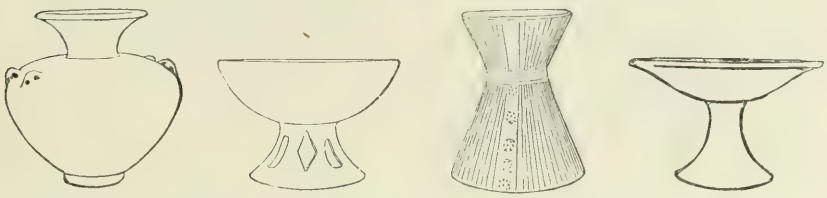
FIG. 51. Arrangement of handles — various groups of ware.

is a single arch springing over the orifice, as seen in Fig. 51, *a*. Again, the handle is attached to one side, as in *b*, but as a rule handles occur in twos upon the shoulder, one on either side of the aperture. They are horizontally attached, as in *c*, or vertically placed, as in *d*, connecting the rim with the shoulder, or they occur low on the body, as in *e*. In rare cases there are four handles, which are arranged as seen in *f* or are set on in pairs. In the elaboration of handles, the use made of animal forms is perhaps the most notable feature. Grotesque figures are made to take the place of handles or are attached to or placed near

them. The treatment is so varied that I shall have to refer the student to the subsequent series of illustrations.

Annular bases or feet were not in very general use in Chiriqui, although in some cases they are modeled with a great deal of grace. The shape varies from a simple ring, barely deep enough to give a firm support to the vessel when placed upon a level surface, to a long, attenuated column with flaring base. The latter is perhaps one of the nearest approaches which America has furnished to the slender foot characteristic of the wheel made ware of Mediterranean countries.

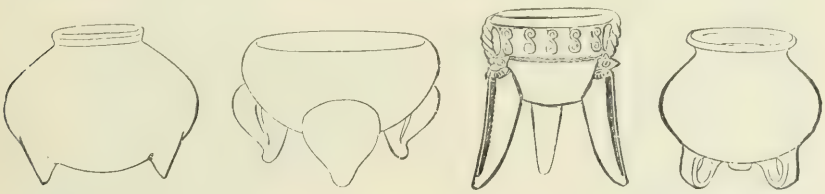
The vessel shown in Fig. 52, *a*, has a somewhat rudimentary foot; another, *b*, a firm, wide base, which is perforated to give lightness; an hourglass-like piece is shown in *c*, and a long, bell shaped foot is seen in *d*. In no part of the world do earthen vessels exhibit such a remarkable development of legs as in Southern Central America.



a *b* *c* *d*

FIG. 52. Types of annular bases or feet — various groups of ware.

The tripod is the favorite support, and in Chiriqui the forms are more graceful than in the neighboring provinces. In a few cases, where the body was modeled in close imitation of animal forms, four legs were used, but three were generally preferred, even for vessels of rectangular or irregular shapes. In the simplest form they are small conical knobs, placed rather close together about the base of the vessel (Fig. 53, *a*), but from these the dimensions increase until the size is out of all reasonable proportion. The maximum development in point of expansion is seen in *b* and the greatest height in *c*. They are frequently modeled after life forms. In a few cases rings or loops are



a Biscuit ware. *b* Biscuit ware. *c* Tripod group. *d* Red line group.

FIG. 53. Forms of legs — various groups of ware.

employed, as shown in *d*. The larger forms, and especially those imitating animals, are hollow and contain round pellets of clay that rattle when the vessel is moved. The manner in which the legs are attached to the body of the vessel leads me to observe that the vessel is inde-

pendently a perfect utensil, and that in all probability the tripod was a feature acquired late in the progress of Chiriquian culture, as a result of some change in the surroundings of the people or in the uses to which the vessel was devoted. Annular bases and tripods would be of little use until level floors of unyielding material came into vogue.

Decoration.—In decoration the pottery of this province exhibits many remarkable features. The work resembles somewhat closely, in a number of its features, that of certain districts lying to the north and to the south, but at the same time it is possessed of very decided individuality. From an examination of the designs I conclude that they represent a period of culture considerably inferior to that of some more northern sections, although the ware itself is nowhere surpassed in grace of form and delicacy of finish.

The ornamentation is pretty evenly divided between plastic and flat forms. The former include relieved features and intaglio features, which are executed in the plastic clay, and the latter comprise figures in color, penciled or painted upon the surface. Each style of work embodies its own peculiar class of conceptions. Relief work is generally realistic or grotesque; incised work is almost exclusively geometric, and embraces combinations of lines usually recognized as archaic. An occasional example is easily recognized as imitative. Painted figures are both geometric and imitative, the two forms blending imperceptibly.

The more important plastic decorations consist of animal forms modeled in the round. Vegetable forms have not been employed. Fillets of clay imitating twisted cords are sparingly used in the decoration of necks and handles, and rows and groups of small nodes are similarly employed. The human figure is always treated in a conventional and usually in a grotesque manner. The animals imitated include a very large number of species. Crocodiles, pumas, armadillos, monkeys, crabs, lizards, scorpions, frogs, and fish appear very frequently. Many of the animals, owing to conventional treatment or to carelessness on the part of the modeler, are difficult of identification. These plastic forms occur in nearly all the groups of ware, and similar forms are found to a limited extent in gold, copper, and stone, as will be seen by reference to the illustrations already given. Their study will, I believe, give some insight into the mental characteristics of the Chiriquians. That their art, so far as these figures are concerned, was not serious is indicated by the sketchy, unsystematic nature of the work, and more especially by the grotesque and occasionally amusing representation of men and animals.

The figures are usually placed upon the shoulder of the vessel or are attached to the legs and handles or form part of them. The favorite subjects are doleful little figures, human or partly so, fixed upon the vessel in a sitting posture, with legs and arms doubled up,

and with expressions which appear to indicate a variety of exaggerated emotions (Figs. 54, 55, 56).

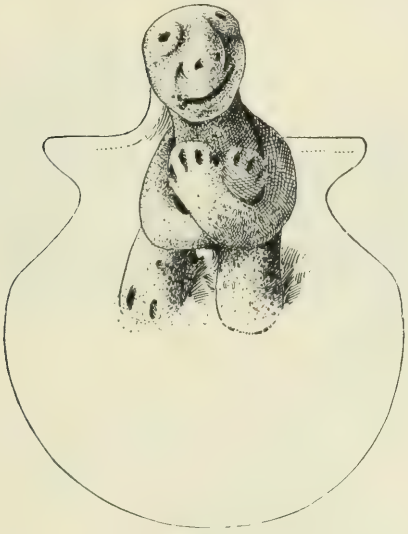


Fig. 54.

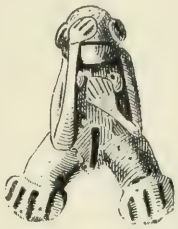


Fig. 55.

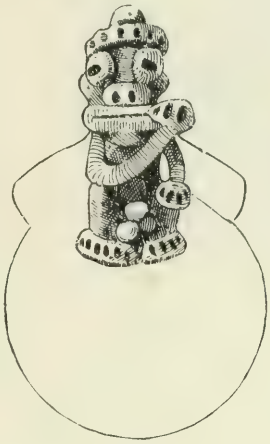


Fig. 56.

Grotesque figures forming the handles of small vases – terra cotta group.

The exuberance of fancy often found vent in the production of monstrosities, such as are seen in Figs. 57 and 58, in which the arms

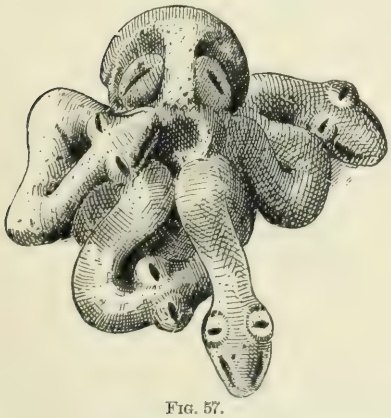


Fig. 57.

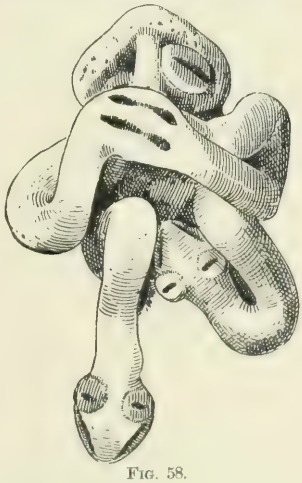


Fig. 58.

Monstrous figures, with serpent-shaped extremities—handled group.

and legs of the figures are writhing serpents, the faces expressing great agony; in other cases the figures are double; and again two bodies united at the waist have but one pair of legs. An unusually grotesque creature is seen in Figs. 59 and 60, and another is given in Fig. 61. Similar figures are worked in gold, one of which is now

FIG. 59.

FIG. 61.

FIG. 60.

Grotesque figures—terra cotta group.

worn as a charm by Mr. J. B. Stearns. Figures of monkeys are shown in Figs. 62, 63, and 64. One creature, represented as having a long,

FIG. 62. Figure of monkey—terra cotta group.

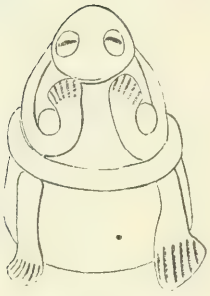


FIG. 63.

FIG. 64.

Figures of monkeys—terra cotta group.

trunk-like snout, recurs frequently. Such a form discovered in the earlier days of archæologic investigation would probably have given

rise to many surmises as to the contemporaneous existence of man and the elephant in Chiriqui. In reality the original was probably some unassuming little inhabitant of the isthmian jungles. This creature is shown in profile in Fig. 65, *a*, and front views are given in *b* and *c*. Innumerable examples, embracing most of the more impor-

a *b* *c*

FIG. 65. Animal forms exhibiting a long proboscis—handled group.

tant animals of Chiriqui, could be given, but in a majority of cases identification is difficult or impossible, as there has been little or no effort to reproduce nature with fidelity. But the chief interest surrounding these figures is not found in the variety of creatures shown or in the character of the delineation, but in the manner of their employment in the embellishment of ceramic forms. The ancient potter must have possessed a keen sense of grace of form and of the proper adjustment of parts. The most cultured taste could hardly improve

FIG. 66. FIG. 67.

Vases illustrating ornamental use of animal figures—terra cotta group.

upon the lines of the vases presented in Figs. 66 and 67, which employ the frog, and in Figs. 68 and 69, in which other creatures are used. Many equally pleasing examples are illustrated further on. The

question very naturally arises as to whether these little figures had any meaning or performed any function aside from that of simple

FIG. 68.

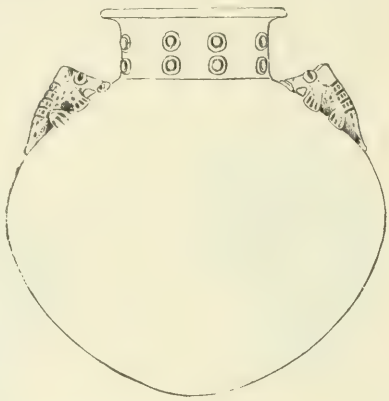


FIG. 69.

Vases illustrating ornamental use of animal figures—terra cotta group.

decoration. I feel inclined to take the view that in their present condition they are survivals of ideographic originals; that if their past could be unveiled we would find that in the primitive ages they were not exclusively employed for ornament. The animals made use of originally were the embodiment of mythologic conceptions, and their images were revered or served as fetiches or charms, and because of this they came to have a permanent place in art. They were applied to the vessel because its office had reference to them or because they were thought to have a beneficial effect upon its functions. It is evident that their employment was governed by well established rules and that they occupied places and occurred in numbers and relations not wholly dependent upon the judgment of the individual potter. We may suppose that they occur in twos because the handles with which they were associated occurred in twos; or, if they serve to take the place of the extremities of the animal forms in the semblance of which the vases were originally modeled, their positions may be related to the original positions of the heads and tails of those forms. It is not improbable that the conventional incised and relieved ornaments, the meanders, nodes, and varied marks refer also to the creatures or the markings of the creatures with which the vessel was associated.

It will be seen, from the above remarks, that we cannot fully determine to what extent these ancient decorators followed the traditional pathways of early ideographic usage or how much they were governed by those powers of esthetic discrimination known to us as taste.

UNPAINTED WARE.

For convenience of description I separate the pottery of Chiriqui

into two grand divisions: the *unpainted* ware and the *painted* ware. Two important groups come under the first head. The first of these, the terra cotta or biscuit ware, comprises a larger number of pieces than any other group and is readily distinguished by its colors, which include only the pale grayish yellow and reddish tints of the burned clay. The second is limited to a small number of pieces and is black or very dark upon the surface and dark within the mass.

The terra cotta group.—This biscuit-like pottery is not in any way inferior to the painted varieties. It bears evidence of great freedom in handling, and serves, perhaps better than any other class of products, to illustrate the masterly skill and the refined taste of the ancient potter. It is said to occur in the same cemeteries and in the same graves with the more important varieties of painted ware. The function of these handsome vessels cannot be determined. It can hardly have been of a domestic nature, as they show no evidences of discoloration or wear, and we are left to speculate upon the possibility of a purely ceremonial use. The paste is moderately fine, but contains an extremely large share of gritty sand; the slip is thin and has received but a slight degree of polish, so that the surface has a dead, somewhat granular effect. As a rule the vases are of small size and are very thin walled. The forms are symmetrical and exceptionally graceful. The ornamentation includes incised figures (mostly geometric), raised decoration (of similar character), and animal forms in the round. The following illustrations are intended to epitomize the multitude of forms, as anything like a complete representation is out of the question.

Bowls, which form a leading feature of the pottery of most primitive peoples, are here rarely seen, excepting as mounted upon tripods or annular bases. There are in the collection a number of small cups of hemispherical shape that may have served as spoons, ladles, or drinking vessels. A few of these are outlined in Fig. 70. Two have minute projections resembling handles affixed to the rim. In rare

FIG. 70. Series of bowls and cups of unpainted ware.

cases these are so prolonged as to be of service in handling the cup; but in no instance is there an approach to the long cylindrical handles seen in the earthenware of other districts.

In following the form scale upward from these simple shapes we find the orifice becoming more constricted and the neck more pro-

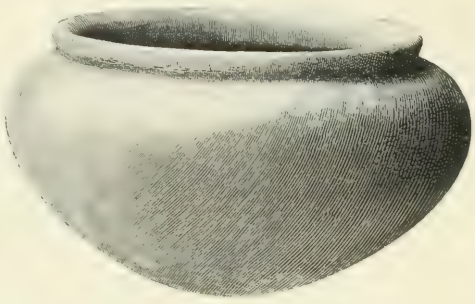


FIG. 71. Vase of graceful form — ¼.

FIG. 72. Vase of graceful form

nounced. The margins are upright, incurved, or flaring, and give variety and grace to the outlines. A tendency toward elaboration

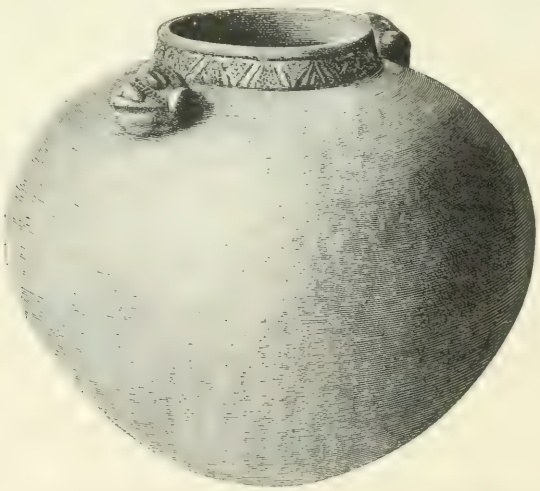


FIG. 73. Vase of fine form ornamented with grotesque heads — ¼.

of ornament accompanies the development of form. Bands of incised or relieved figures are carried around the neck, shoulder, and handles and are added in such a way as greatly to enhance the beauty of the vessel. The forms of these vessels are so graceful and the finish is so perfect that one is tempted to present an extended series, but it will be necessary to confine the illustrations to a limited number of type specimens. Fig. 71 shows a somewhat shallow form of great simplicity and grace. That in Fig. 72 is deeper, with a narrow neck and a more decidedly conical shape. Two minute grotesque figures are perched upon the shoulder. Fig. 73 represents a larger vessel of good form, which has a neat incised pattern encircling the slightly incurved

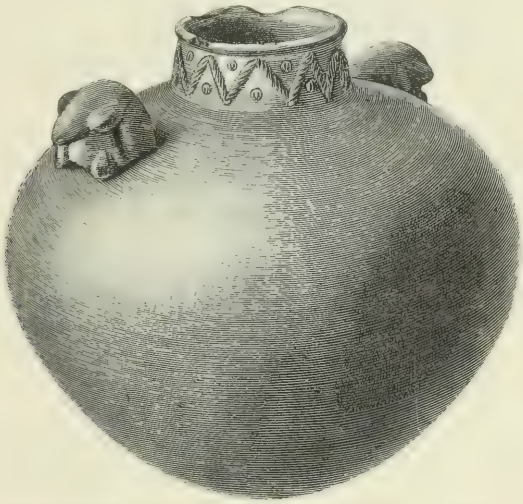


FIG. 74. Vase of fine form, ornamented with grotesque heads ½.

neck. Grotesque heads are set upon the shoulder. A form somewhat more refined is shown in Fig. 74. The neck is furnished with a relieved ornament, consisting of a meandered and indented fillet,

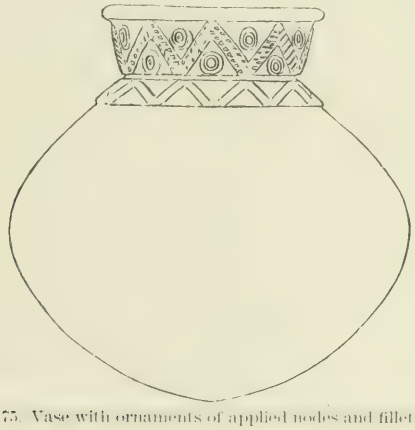


FIG. 75. Vase with ornaments of applied nodes and fillets ¼.

accompanied by two rows of minute indented nodes. The heads are probably intended to represent the armadillo. They are hollow and contain movable pellets. The fillet ornaments are always tastefully treated, and in many cases represent twisted and plaited cords. Some are marked in herring bone fashion and others have transverse indentations. Small pellets of clay were much used and to excellent advantage. They were set on lightly with the fingers and

FIG. 76. Vase with mantle covered with incised figures—½.

firmly pressed down with minute pointed or edged tools and hollow straws or reeds (Figs. 75 and 76). Some of these nodes are finished

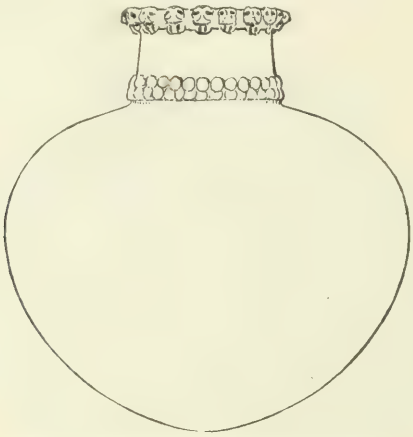


FIG. 77. Vase with frieze of grotesque heads—½.

to represent the heads of animals. This is done with an ease and a simplicity that call forth our admiration (Fig. 77).

Fig. 78 illustrates a series of vases having flaring rims, the treat-

ment otherwise being uniform with the preceding. We notice in these vessels a decided tendency towards complexity of outline. Three examples, shown in Fig. 79, have a two storied character, the

FIG. 78. Vases with flaring rims and varied ornament — ⅛.

upper part possibly being the outgrowth of the collar ornament seen in so many cases. The large specimen in the center is a handsome

FIG. 79. Vases with complex outlines and varied ornament — ⅛.

piece with square offset at the shoulder and a decidedly conical base. A chaste ornament in relief encircles the neck and two grotesque figures are seated upon opposite sides of the shoulder. The vase at the left has two orifices, set wide apart. The body is oblong and slightly flattened above. There are a number of vessels of this conformation in the collection, some of which have the mouths so close together that the margins or lips coalesce in part. A superb specimen of this class is illustrated in Fig. 80. The shape is thoroughly satisfactory to the eye, having a refinement of line rarely attained in native American work. Its symmetry suggests the use of the wheel, but the closest examination fails to detect a trace of mechanical appliance, save that left by the polishing stone. The decoration is simple and effective, consisting of minute nodes with annular indentations about the necks and of two grotesque figures, placed with consummate taste in the angles formed by the contact of the two necks.

A very small percentage of these vessels possess true handles, but

these, in some of the examples, are worthy of high admiration. The specimen presented in Fig. 81 attracts attention at once on account

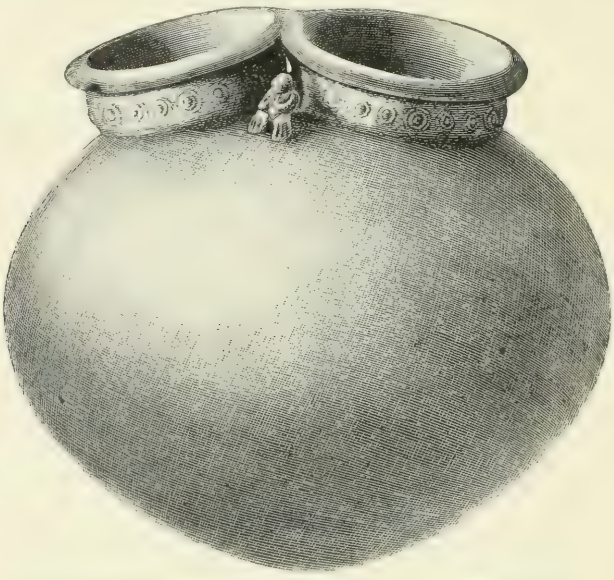


Fig. 80. Large vase with two mouths and neatly decorated necks. ½.

of its resemblance to well known classic forms. It is evident, from a study of this piece, that only a step more was necessary to place

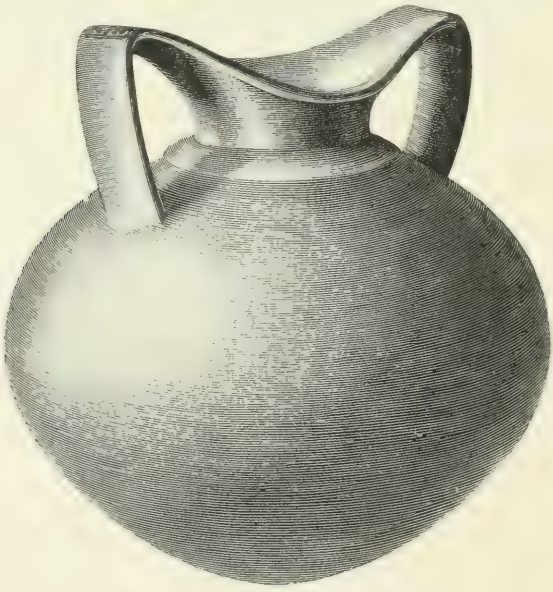


Fig. 81. Large vase with high handles. ½.

these potters alongside of the highest masters of the art. The sharp high elbow and the broadening of the handles at their junction with the lip are notable features. The latter is shown more satisfactorily in Fig. 82, which is a top view of a companion piece. I wish to call

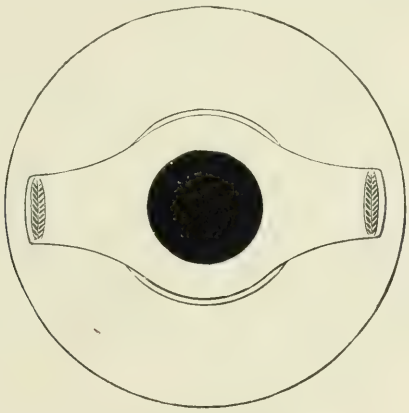


FIG. 82. Top view of high handled vase ⅓.

attention here to a peculiar feature of these handles and one repeated in vessels of other classes. At the elbow of each handle we find a device in relief marked with herring bone indentations that would seem to represent a kind of textile attachment, as if, at some previous time and perhaps in an antecedent form of vessel, the upright and horizontal parts of the handles had been stitched or tied together at this point. Yet it is by no means certain that this feature is not the survival of some feature of an animal form into the semblance of

FIG. 83.

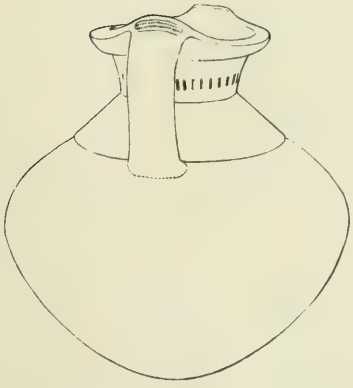


FIG. 84.

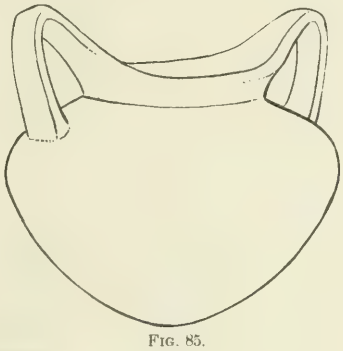


FIG. 85.

Examples of handled vases ¼.

which, as seen in other examples, this feature has a tendency to graduate.

These vessels are not numerous, but acquire importance from their large size, the larger being upwards of eight inches in height. A few pieces of nearly identical shape, but of small size, are found among the painted wares. Additional shapes are given in Figs. 83, 84, and 85, and serve to illustrate the extent of variation exhibited in this group of vases. The small shallow piece is exceptionally fine and the handles are furnished with animal features of a highly conventional type. An expansion of the handles somewhat similar to this is frequently seen in vessels of other classes, especially in those of the handled group.

Single handles of like character occur in a number of cases upon minute cups, an example of which is given in Fig. 86. It would seem that possibly in such cases the rim had been expanded and prolonged for the purpose of giving support to the animal figures with

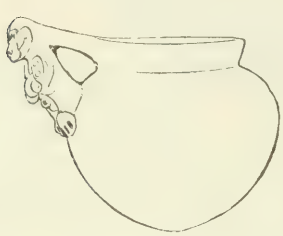


FIG. 86.

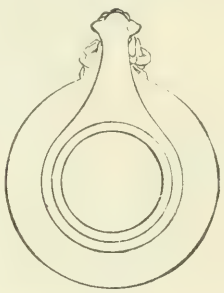


FIG. 87.

Small cup with single handle ornamented with grotesque figure ½.

which the shoulders were embellished. The expansion is probably the outgrowth of the use of animal figures in connection with simple handles.

FIG. 88. Vase of eccentric form—½.

We have a number of vessels of this group the bodies of which imitate animal forms, but they are in nearly all cases furnished with

legs. Rarely we meet with compound or eccentric forms. An interesting specimen of the latter class is seen in Fig. 88. Such shapes are common in Peru and are occasionally met with in Central America. The two strong handles are decorated with minute images of birds and the bottom is concave, an exceptional character in Chiriquian work.

The illustration of this group of vessels would not be complete without a series of tripod vases. In shape of body these vases differ but little from the legless forms already given, excepting where the use of life forms has led to eccentric modifications. Very great interest attaches to the modeling of the tripod supports, upon which the potters have expended much time and ingenuity.

The illustrations given herewith are chosen from a great number of examples and are intended to convey an idea of the range of forms, both of the vessels and of their supports. Figs. 89 and 90 show plain forms of legs, all of which are hollow and contain small pellets of clay. The openings are generally wide vertical slits, and are placed in front, as seen in Fig. 89, or in the side, as in Fig. 90; but in exceptional

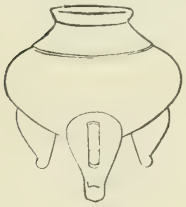


FIG. 89.

FIG. 90.

Vessels illustrating forms of legs. ½.

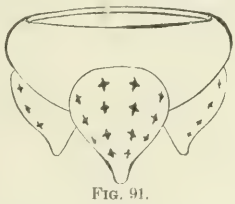


FIG. 91.

Vessel with large legs ornamented with stellar punctures. ½.

cases they take other shapes and are scattered over the surface, as seen in Fig. 91. The legs are often remarkable in form, being swollen to an enormous size above and terminating in small rounded points

FIG. 92. Vases of varied form with plain and with animal shaped legs. – ¼.

below. The bowls are symmetrically shaped and graceful in outline. In Fig. 92 I present a group illustrating some of the more eccentric forms of bowls and a variety of their supports. A very superior piece and one of the largest of this style is shown in Fig. 93.

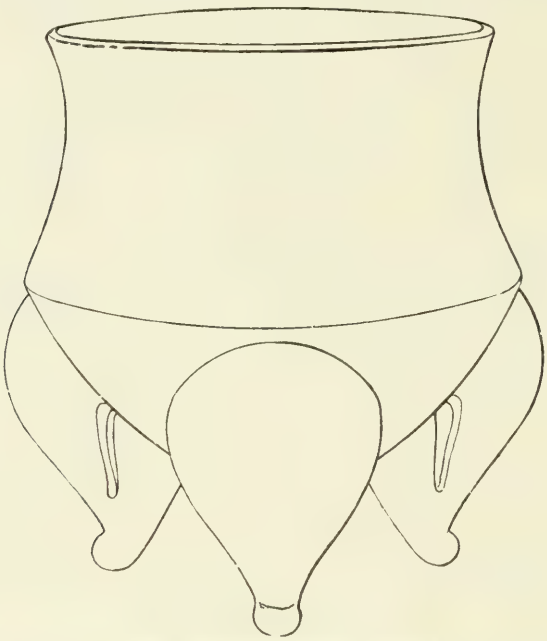


FIG. 93. Large vase of striking shape. ¼.

It will be seen that in a number of cases the legs are modeled to represent animal forms. This feature is brought out more clearly in succeeding figures. The creatures represented are often grotesque, as

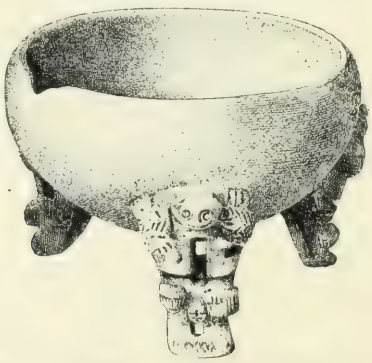


FIG. 94. Cup with legs imitating animal forms. ⅓

seen in Figs. 94 and 95. The human form is rarely shown in a way to make it clearly distinguishable from the figures of monkeys and other animals. The armadillo is a favorite subject. An example of

small dimensions is illustrated in Fig. 96, in which this animal is given in characteristic style, and a more pretentious piece is shown in Fig. 97. The characteristics of the creature are very simply but graphically expressed. In the first the hard ribbed and figured case is represented by applied fillets and nodes, and in the other by incised

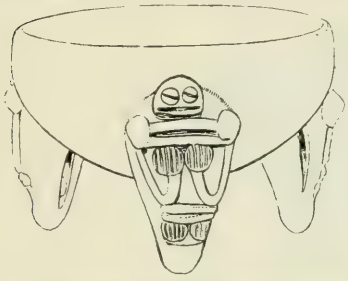


FIG. 95.
Cup with legs imitating a grotesque animal form — ½.

FIG. 96.
Cups with legs imitating the armadillo ½.

FIG. 97.

lines. The frog is also much used (Fig. 98). A rather remarkable conception is illustrated in Fig. 99. Upon the front of each leg is a curious little animal-like figure, to the front of which are bound two minute infantile creatures. In the piece presented in Fig. 100, the

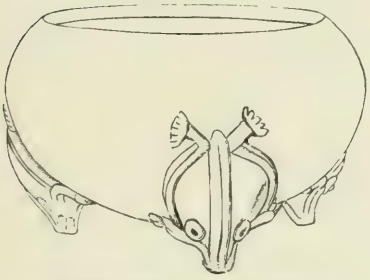


FIG. 98. Cup with frog shaped legs — ½.

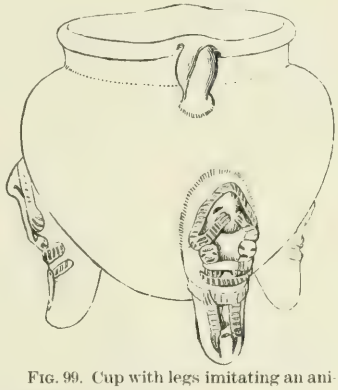


FIG. 99. Cup with legs imitating an animal and its young — ¼.

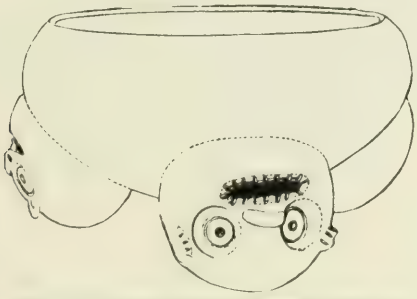


FIG. 100. Cup supported by grotesque heads — ½.

legs are grotesque heads, inverted, with wide open mouths and glaring eyes. The work upon this vase is very superior.

The remarkable specimen illustrated in Fig. 101 is furnished with unique supports. Two rudely modeled, semihuman, grotesque figures are affixed to the under surface of the bowl, supporting it with their backs.

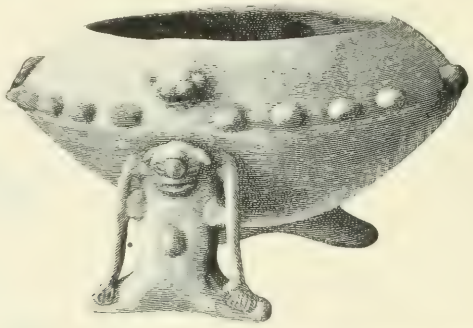


FIG. 101. Large cup supported by two grotesque figures. ¼.

The legs of these figures are spread out horizontally, so that a firm support is obtained. The periphery of the body of this vessel is encircled by a number of nodes and noded projections, which represent the heads, tails, and spines of two crab-like animals. The heads, with arms attached, appear at the right and left, and the tails occur at the front and back just over the heads of the supporting figures. The use of the crab in this way is quite common. Fish, birds, and a variety of quadrupeds are similarly treated. Some very interesting

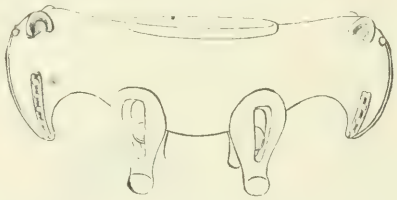


FIG. 102. Cup with two animal heads attached to the sides.—¼.

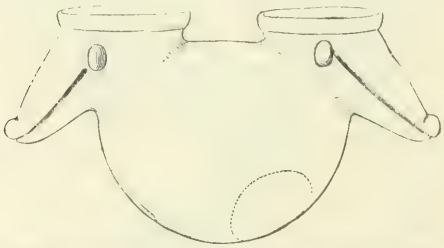


FIG. 103. Cup with two animal heads attached to the sides. ¼.

examples of double headed animal vases are found. Two of these are outlined in Figs. 102 and 103, the first having a single orifice and the

second a pair of orifices. In many cases the bowl of the vessel is considerably modified, to give a more decided resemblance to the

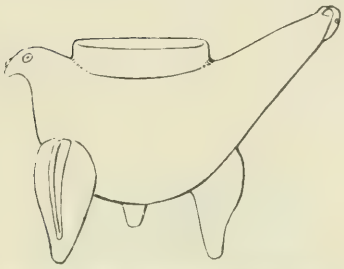


FIG. 104. Vase imitating an animal form — ⅓.

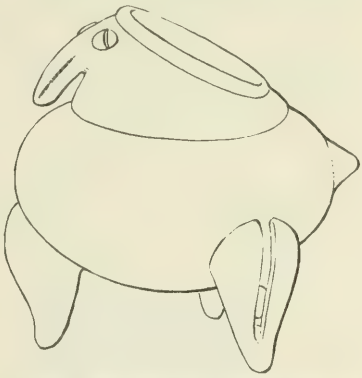


FIG. 105. Vase imitating an animal form — ⅓.

FIG. 106. Vase shaped to imitate an animal form — ⅓.

body of the creature. This is well shown in Figs. 104–106. The first is probably intended for a bird; the second resembles an armadillo;

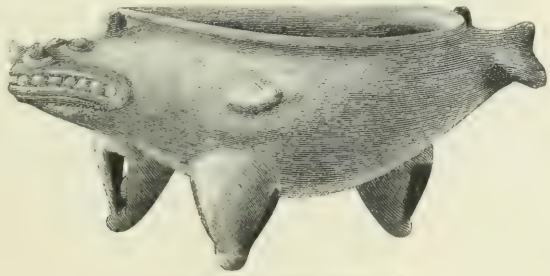


FIG. 107. Fish shaped vessel — ¼.

and the third portrays a creature with ears and three horns. The oblong vessel shown in Fig. 107 is modeled after a curious fish,

to which the Chiriquians seem to have attached considerable importance. It is represented with a wide mouth displaying teeth, two spines or horns upon the end of the snout, and fins upon the back and sides. Fig. 108 gives the top view of another fish vase, which is supported, as are the others, by three legs. The body is flat and is encircled by well modeled fins. The head is rather flat and has the

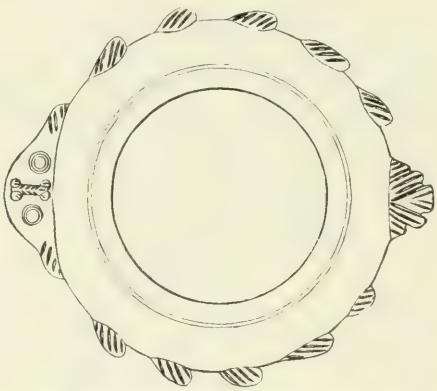


FIG. 108. Top view of a fish shaped vessel $\frac{1}{3}$.

eyes and nose on the upper surface. I close this series of illustrations with an outline of a fine vase (Fig. 109) the rim of which is decorated with a single head of extremely grotesque and repulsive character.

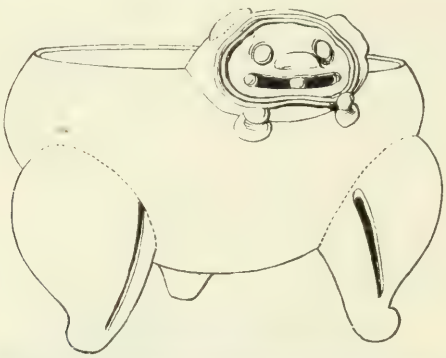


FIG. 109. Cup with grotesque head attached to the rim – $\frac{1}{2}$.

Black incised group.—This pottery, although closely related to the other varieties in its leading features, presents differences of a pronounced character. The number of specimens recovered is rather small. The largest piece has a capacity of perhaps a quart. Some of the forms are identical with those of other groups, but a few are peculiar to this ware. The color is black, brown, or dark gray, and in most cases the entire mass is quite dark. The decoration is executed in two somewhat distinct styles: in one the lines were scratched or engraved subsequently to the hardening of the clay; in the other

they were deeply engraved with a sharp point while the clay was still moist. The lines are usually very deep and are filled with a white substance which renders the pattern distinctly visible upon the surface. It seems probable that the lines were engraved deeply with the intention of producing this effect. Type specimens are shown in Figs. 110 and 111. They are small globular bottles, with short necks and wide apertures and with handles placed at opposite sides of the lip, which is prolonged to meet them. The design covers a large part of the body and is separated into two parts by the handles and the undecorated panels that descend from them. The figures appear to be

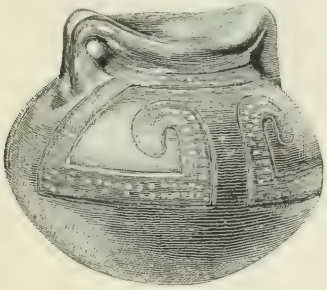


FIG. 110.

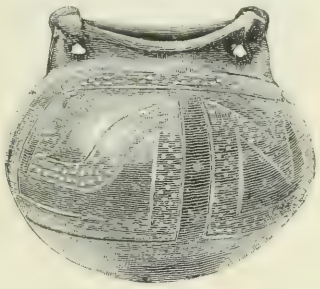


FIG. 111.

Black cups with incised reptilian figures—½.

very highly conventionalized animal forms, probably serpents. The coiled ends of the ribbon-like dotted bands are evidently meant to suggest the heads of reptiles. The figures assume a variety of shapes and

FIG. 112. Black vase with conventional incised pattern—¼.

grade by degrees from the recognizable life forms into purely geometric patterns. Examples of the latter style are given in Figs. 112 and

113. The motives employed, although so conventionally treated, are pretty certainly identical in origin with the preceding.

There are a number of tripods in this group, some of which have the deeply incised ornaments and others the shallow ones. The shapes vary greatly, a few examples being decidedly Costa Rican in type.

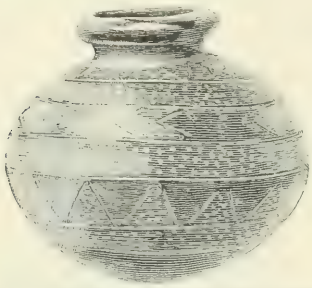


FIG. 113. Small cup with conventional incised patterns ½.

FIG. 114. Small tripod cup with upright walls and legs imitating animal heads—½.

Pieces with round bodies have conical legs, like much of the Chiriquian ware, but those with shallow basins and angular, incurved, upright, or flaring rims have the Costa Rican tripod. Figs. 114 and 115 may serve to illustrate this variety. The first is a cup, with

FIG. 115. Vase with flaring rim and legs, imitating animal heads ½.

upright sides and thick rim, having an incised geometric pattern. The second is much more striking in appearance. The surface color is brownish gray in hue and the simple geometric design was scratched through into the lighter color beneath after the clay hardened. The legs represent the heads of animals conventionally treated and are hollow, containing movable pellets. This specimen is from latitude 8° 42′ north, longitude 82° 52′ west. Others of this class come from different parts of the province.

To this class belongs also a small dark vase of peculiar shape and interesting decoration, which is illustrated in Fig. 116. The neck is large and the lip widely flaring, and the body is modeled in imitation

of the head of some animal, possibly a peccary. The side representing the face is prolonged, giving an unsymmetric profile, as seen in the second figure. The eyes are set midway between the ears (which

FIG. 116. Vase modeled to resemble the head of an animal – ¼.

are placed at the sides) and the nostrils, and are inclosed by curious engraved figures, probably suggested by the markings of the animal portrayed. An arched ridge, representing the brows, connects the bridge of the nose with the ears. The most novel feature of this piece is the band of incised ornament that crosses the back of the

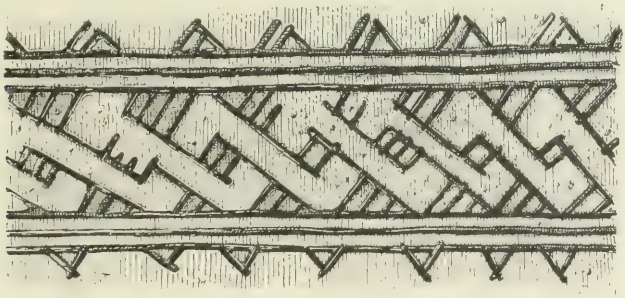


FIG. 117. Pattern upon the back of the vase presented in Fig. 116.

head and serves probably to carry out the idea of the complete creature. As will be seen by reference to the figure, it is a guilloche-like interlacing of fillets, bordered and apparently held in place by longitudinal bands, beyond which the angles of the ornament project. The pattern is a modified form of one commonly seen upon the margins of the larger stone metates, and, although rarely met with in the pottery of Chiriqui, was a favorite motive with the potters of Costa Rica. This vessel comes from 30 miles north-northwest of David.

The unpainted wares here so briefly described are typically Chiriquian, and are closely associated in the graves with most of the leading groups of art products of the province. It must be allowed that

they take first rank in the isthmian states, if not in America, for simplicity and refinement of form, perfection of method, and purity of style.

PAINTED WARE.

The painted vases of Chiriqui embrace at least ten easily distinguished varieties of ware. The characters upon which the classification is based are somewhat heterogeneous and include material, color, shape, finish, ornamentation, method of manufacture, and evidences of use. No single character and no one group of characters can be relied upon to distinguish the different groups. We must depend, therefore, upon an assemblage of characters or upon one character in one place and another in another place. Observing a number of striking differences in two groups of ware, we arrive at the conclusion that these groups must have been the work of distinct communities; yet we find very marked differences in wares that (through the possession in common of some particular feature) we know to be the work of the same hands. We can, therefore, determine little in regard to the peoples concerned.

I do not consider the presence in a single grave of two or more varieties sufficient proof of their common origin, for a number of distinct wares may come into the possession of one community through trade, conquest, or the spoliation of tombs; but a constant recurrence together of the same forms affords strong evidence that the objects were the work of the people with whom they were buried. Unfortunately our observations in the field are not sufficiently accurate to enable us to utilize associations or methods of occurrence in the graves as a means of classification.

The following classification is, under the circumstances, the best that I can devise, and is of use mainly as a means of facilitating description. The name chosen generally indicates a leading or striking characteristic of the group.

The *scarified* group, separated widely from all other varieties.

The *handled* group and

The *tripod* group, apparently the work of one community and devoted to the same or similar uses.

The *maroon* group;

The *red line* group;

The *white line* group;

The *lost color* group;

The *alligator* group; and

The *polychrome* group, no two of which are sufficiently alike to make it certain, without extraneous evidence, that they were manufactured by the same community, yet all clearly belonging to one great family.

These groups are presented in the order given.

Before proceeding with the descriptions, however, there are some matters of a general nature that should be referred to. Technical questions have already received considerable attention, and I shall need only to refer here to the painted ornamentation, and at sufficient length to insure a clear understanding of its treatment and the scope of its subject matter.

Painted vessels are embellished to some extent also by incising and modeling, and these methods are employed very much as in the unpainted pottery already described.

Painted decoration is executed with much freedom and in many cases with considerable skill. It is greatly varied in method of treatment and embraces a wide range of motives. Geometric patterns occur in great variety, but are found to be of types peculiar to Isthmian America. The conventional meanders, frets, and scrolls so extensively employed in other regions are here almost unknown. Decorative motives derived from natural forms are abundant and afford an excellent opportunity to study the processes of conventional modification. These designs are often applied in a way to indicate that the decorator possessed a keen sense of the requirements of the vessel, although the treatment perhaps is not as universally satisfactory as is the treatment of plastic embellishment.

The potter, in preparing the vessel for the decorator, ordinarily finished it with a slip or wash of fine clay, which varied in hue from a gray white to a pale orange. A slip of bright red tint was also extensively used. The more delicate hues formed an excellent ground upon which to work. The slip covered surface was generally polished, often to a high degree, with the usual polishing implements, the marks of which can be seen upon the less carefully finished surfaces. By observers unacquainted with aboriginal methods this polish is liable to be taken for a glaze, and it has been pronounced a vitreous glaze by a few writers. It is more noticeable upon specimens that have been handled a great deal, as is the case with whistles, needlecases, and the like.

The colors utilized in decoration, so far as they have been preserved, are the ground tints, described above, and the delineating colors, the latter consisting of black, white, red in various hues, and a dull purple. An additional color (or perhaps a solution without particular color) extensively employed in the designs has totally disappeared. The nature of the various colors has not been determined, but it is probable that some were of mineral and others of vegetal origin.

Red was often employed as a ground color, as stated above, and sometimes covered the whole surface, but more frequently occupied zones or panels. In such use it was applied and polished down with the slip. Red was also extensively used in the delineation of decorative figures in several of the groups of ware, and is in all cases a permanent color. The hues vary decidedly with the groups of products,

suggesting differences in people or in environment. White may have been freely used, but it is preserved in a few cases only, in which it was used in the production of simple decorative patterns, and appears to have been a somewhat thick or pasty color. Black was extensively used and was of two distinct kinds: a thick permanent pigment, employed in the delineation of designs, and a thin color, not so permanent and employed exclusively as a ground upon which to execute designs in other mediums. The latter may possibly be of vegetal derivation. Its use was confined to a single variety of ware, the lost color group. The former was employed in all the other groups, with one exception, the red line group.

The light purple tint is but sparingly used and only in the polychrome group. It is very effective in combination with the reds and blacks upon the orange ground of this ware. It is probably of a mineral nature.

What I have denominated the lost color was a pigment, or "taking out" solution, extensively and exclusively employed in the decoration of one of the principal groups of ware. Its former existence is made known by its action upon the ground colors and upon the paste or slip within the areas covered by it. Where superimposed upon black, that color has in all cases been removed, exposing the underlying tints of the slip in which the designs are now manifested, the interspaces being still black. In some cases the lost color has not only removed the black ground, but has affected the slip beneath, removing it also, and to such a degree that the polished surface is destroyed and shallow intaglio lines occur, leaving the interspaces in relief. This circumstance enforces the idea that possibly the "lost color" was really not a color at all, but an acid which acted upon the ground colors at once, destroying the black entirely and leaving the effect now seen. This point must remain for the present undetermined.

The figures in all cases appear to have been delineated with ordinary brushes and by purely free hand methods. The degree of skill varies greatly. The execution in the great body of the work is rather inferior and indicates a lack of skill and care, but in a limited number of pieces the manipulation is masterly.

The designs are confined to the show spaces, being exterior in narrow necked vessels and generally interior in shallow forms.

In arrangement upon the surfaces this decoration presents some novel features. The slight degree of uniformity in arrangement indicates the absence of any mechanical aid, such as the wheel, which device would tend to reduce all decoration to a series of horizontal zones. We observe indeed the occurrence of horizontal arrangements, but not to a degree greater than would naturally arise as a result of the conformation of the vessel. Upright, oblique, and arched arrangements are frequently met with, and all are safely attributable to the domination of spaces to be covered or to the influence of antecedent

shapes. Examples and details are given as they come up in the various sections.

The scarified group.—This group is represented by about forty specimens and is worthy of especial attention. It comes from the graves of two localities, one near C. E. Taylor's hacienda, north of David, on the slopes of Mount Chiriqui, and the other at Alanje, southwest of David. As a variety of ware it stands so entirely alone that had it arrived unlabeled no one would have recognized its affinities with Chiriquian art. It is rather inferior in material, grace of form, and surface finish, and the decoration appears to belong to a lower grade of culture than that of the other groups. It is possibly the work of an inferior race in comparatively recent times.

Nearly all the vessels are tripods, but a few have rounded or flat bottoms and a few are supplied with annular stands. The walls are thick and the shapes are uncouth or clumsy. The paste is coarse, poorly baked, and friable; near the surface it is a warm reddish or yellowish gray; within the mass it is a dark gray.

The makers of this pottery, like their brother artificers, took especial pleasure in the modeling of life forms. The work exhibited in these specimens is, however, exceptionally rude. In some cases grotesque heads are attached to the rims of bowls; in others the head, tail, and

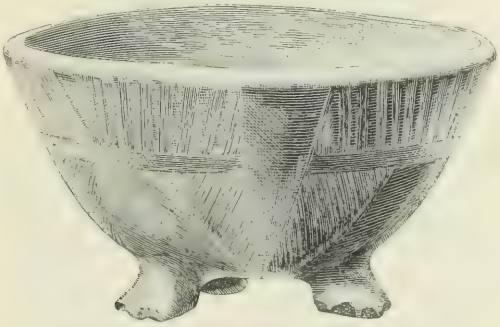


FIG. 118. Tripod bowl of red scarified ware - $\frac{1}{3}$.

FIG. 119. Tripod bowl of red scarified ware — $\frac{1}{3}$.

feet of animals appear about the periphery of the vase; and in a number of cases the legs of the tripods are modeled to represent the forms of living creatures. Generally the feet are clumsy in shape and three toed, suggesting the feet of the tapir.

These vessels are embellished by painting, incising, or scarifying and by modeling in relief. Color was not employed in the production of designs, but a dark Indian red pigment was daubed over that part of the surface not occupied by incised ornament. Little or no slip was used and the rude geometric patterns were executed with pointed tools in a very hap-hazard manner.

The bowls are more numerous than in any other group of the Chiriquian ware, but, as in the other groups, they are supplied with sup-

FIG. 120. Oblong basin with scarified design—$\frac{1}{3}$.

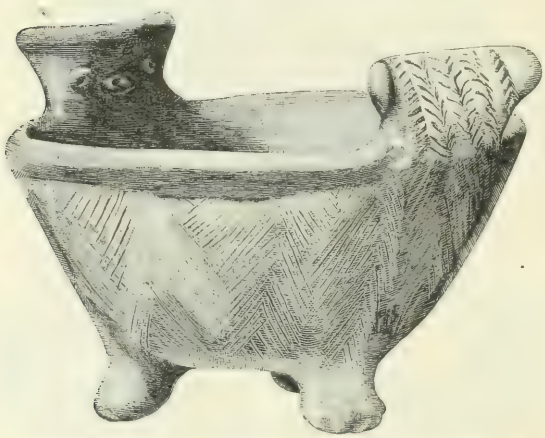


FIG. 121. Large bowl with handles imitating animal heads—$\frac{1}{4}$.

ports, either tripods, shaped like the feet of quadrupeds, or rude annular bases. In most cases the rim expands gradually from below, as seen in Fig. 118, or is recurved, as shown in Fig. 119. In a few cases the basin is oblong or boat shaped and the ends are pointed, as indicated in Fig. 120.

An interesting specimen is illustrated in Fig. 121. At the opposite ends of the bowl portions of the rim are carried upward and inward, forming handle-like appendages, modeled to represent, rudely, the heads of animals. Details of form and ornament are well brought out in the cut.

In Fig. 122 we have a high cylindrical shape with a flat bottom, the surface being scarified in vertical bands. A small pot, having an annular base and decoration similar to the preceding, is given in Fig. 123. In Fig. 124, instead of the vertical lines, we have a series of heavy ribs. Two strong vertically placed loops are fixed upon opposite sides of the shoulder and the base is supplied with the usual feet.

FIG. 122. Jar with flat bottom and vertical bands of incised ornament—$\frac{1}{3}$.

The tripods shown in Figs. 125 and 126 are somewhat mutilated, but they present features of interest in the novel shapes and the unique

FIG. 123. Vase with stand and vertical incised bands—$\frac{1}{3}$.

FIG. 124. Vase with handles, legs, and vertical ribs—$\frac{1}{3}$.

animal forms with which the legs are embellished. Each leg is represented as a complete animal, whose back or breast supports the ves-

FIG. 125. Tripod with owl-like heads at insertion of legs. ¼.

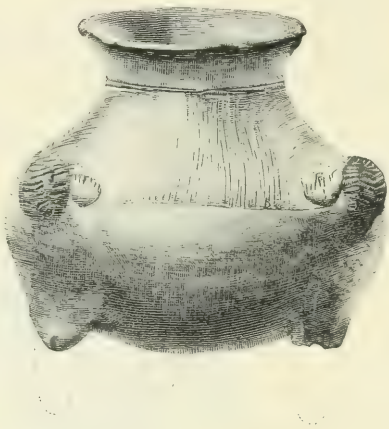


FIG. 126. Tripod with legs rudely suggesting animal forms.—¼.

sel and whose cylindrical nether extremity rests upon the ground. The head in the first example resembles an owl and in the second reminds one of some crustacean form. An additional specimen of

FIG. 127. Heavy red vase with four mouths.—¼.

considerable interest is shown in Fig. 127. It is a heavy tripod, having four independent mouths, all opening into one chamber. The shape is unsatisfactory, being heavy and unsymmetrical. The exterior surface has the usual scarified figures and the interspaces and the entire inner surface of the vessel are painted red and rather carefully polished.

The handled group.—The series of vessels to which this name is given comprises a large number of pieces of unusually even characters.

They are obtained from a pretty wide district to the north and west of David and occur in connection with other groups. They are notable for uniformity in size, shape, and finish and for the unmistakable evidences of use over fire which at least three-fourths of them show. With the exception of a few large caldrons, not yet assigned to a particular group, they are more like ordinary cooking vessels than any other group of Chiriquian ware. The size, however, is remarkably small, the average capacity being about a pint. Larger pieces contain a quart or three pints.

The body is usually much compressed vertically and is flattish above and more or less conical below, giving a very graceful contour. The surface is rather rudely polished and the painting is done with notable carelessness, as if the intended use were not favorable to the preservation of the ornament. By means of a heavy brush, red figures, consisting of splotches, stripes, arches, and encircling bands, were applied to the yellowish gray surface and sometimes, as indicated by a smeared appearance, were polished down with an implement. It does not seem that a slip of ordinary white clay was very generally used. In a few cases a grayish blue tint appears upon some of the wider spaces.

The handles are perhaps the most notable feature of this ware, and usually occur two to a vessel; rarely there is but one handle and in a few cases there are four. This group may be separated into at least four sections by the styles of handles. Vessels of the two more important sections have two handles each, which are placed vertically in one variety and horizontally in the other, reference being had to the position of the points of attachment. These differences of position have given rise to a marked difference in the shape of the orifice and

FIG. 128. Vase with horizontally placed handles and rude designs in red – ¼.

of the lip. The handle is a simple loop, which in the one variety is placed as seen in Fig. 128 and in the other as in Fig. 132. In the latter case one end of the loop is fixed to the shoulder and the other end

to the lip, which is uniformly prolonged at the contact and is also widened all around; the result is the curious winged outline shown in Fig. 133.

A third variety of handle is a single arch, which spans the orifice and is attached to opposite sides of the expanded lip. In a fourth variety the looped handles are replaced by the heads of animals, which are set upon the shoulder of the vase, as are similar features in other groups of ware.

A type specimen with the horizontal loop is shown in Fig. 128. The lip and a wide belt about the body are painted red and the shoulder is occupied by rudely executed arched strokes of the same

FIG. 129. Unpolished vase with heavy handles and coated with soot—$\frac{1}{4}$.

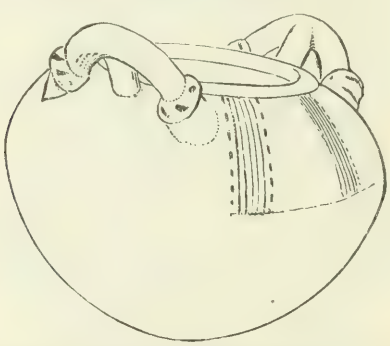


FIG. 130. Round bodied red vase with unique handles and incised ornament—$\frac{1}{3}$.

color. A much less usual shape is given in Fig. 129, which exhibits some characters of contour that remind us of well known Grecian forms. Another novel variation from the type is seen in Fig. 130, in which the arch of each loop is divided by an upright piece. A neat incised ornament occupies the shoulder of this vessel and the remainder of the body is finished in pale red.

It will be observed that the handles are rarely wholly plain. Each loop is supplied with one or more rings or ring-like fillets, or with small nodes, generally near the most prominent part of the curve or arch. By the study of a large number of specimens I am able to trace these puzzling features to their origin. They are the representatives of life forms which were originally modeled in full detail and which are still so modeled in many cases. The nodes and like features are atrophied heads, hands, or feet, and in some cases are marked with indentations that refer to the eyes or to the fingers or toes, and the round fillets stand for the arms and legs of animals, or, if notched in peculiar ways, may be referred to other originals, such as the mouths of fishes or the spines of crabs. Examples could be given showing all stages of the progress of simplification.

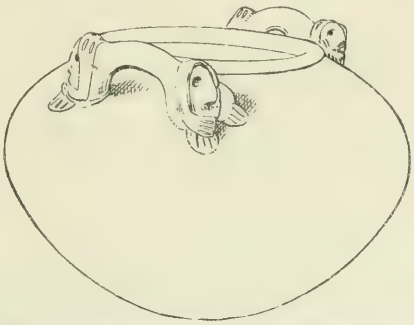


Fig. 131 Vase with grotesque figures attached to the handles — ½.

Fig. 132. Vase with upright handles and winged lip — ½.

In Fig. 131 I present a fine example of the horizontal loop, in which the opposite ends are supported by grotesque animal figures, applied, however, in a way not detrimental to the grace and simplicity of the vessel.

An example shown in Fig. 132 is of especial interest in this connection. The ornament upon the handle serves as a link between

the realistic life form and the conventional nodes and fillets. In this case the node is supplied with eyes and a mouth, and the double roll of clay beneath is manifestly intended for the arms, the handle itself standing for the body. The loop is upright and joins the shoulder

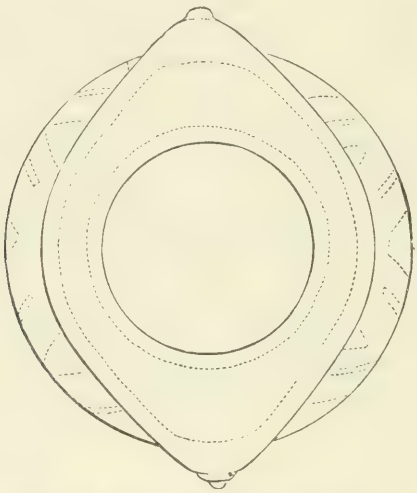


FIG. 133. Top view of vase with winged lip ½.

to the rim. The winged character produced by the expansion at the contact of handle and lip is shown to advantage in the top view (Fig. 133.) In some cases this expansion is so great as completely to hide the body of the vase when viewed from above.

Examples are outlined in Figs. 134 and 135 in which the life form

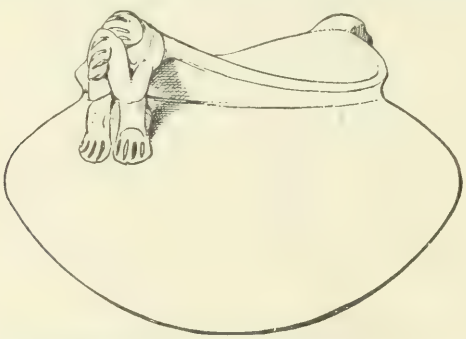


FIG. 134. Vase with grotesque animal shaped handles .

is clearly defined. In the first we have a human-like figure, the face of which is entirely hidden by the hands. In the second we observe a curious little animal figure, with a long curved proboscis and a body covered with annular indentations. In general shape and in ornamentation these vases do not differ from the preceding. A remarka-

ble piece, with two pairs of handles, is presented in Fig. 136. Grotesque figures are attached to the outer surface of the loops, one in each pair being placed in an inverted position. The two figures seen

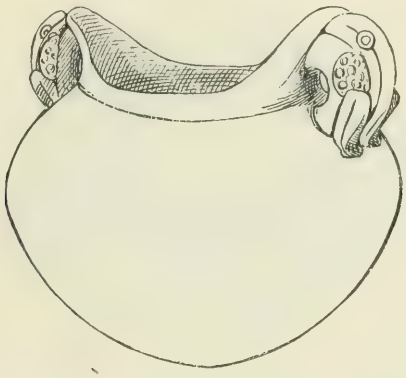


FIG. 135. Vase with handles representing strange animals—$\frac{1}{4}$.

in the cut are simple, but those on the opposite pair of handles are compound, being double above the waist. The faces, hands, and feet of these figures are touched with red, and the lip and body of

FIG. 136. Vase with two pairs of handles ornamented with grotesque figures—$\frac{1}{4}$.

the vase are decorated with carelessly drawn stripes of red. In another case four plain handles are placed equidistantly about the neck of the vessel.

In a third variety the loop is omitted entirely, the animal figure taking its place upon the shoulder of the vase. This feature appears

in the specimen given in Fig. 137 and represents the front part of a reptile, the head being hollow and containing a large movable pellet. This is a handsome piece, well finished, and decorated in the usual broad way.

FIG. 137. Vase with handles representing animal heads, which are hollow and contain pellets of clay —¼.

A fourth variety is shown in Figs. 138 and 139, in which the handle spans the orifice as in an ordinary basket. The lip is flaring and is

FIG. 138. Vase with arched handles embellished with life forms in high relief—¼.

prolonged at the sides to meet the handle. In one case the outer surface of the handle is embellished with figures of frogs and serpents,

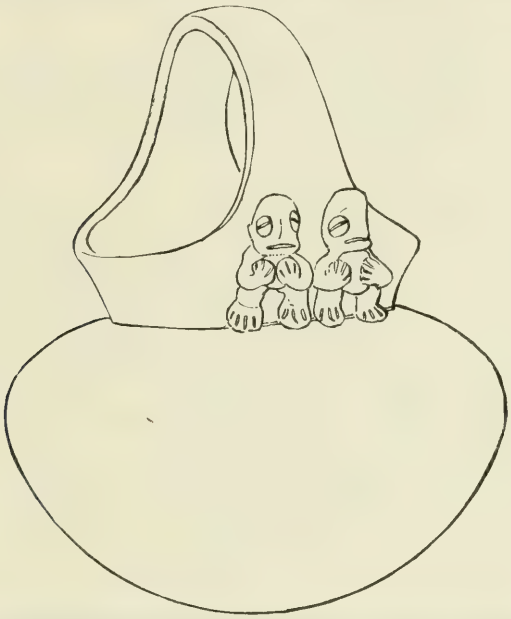


FIG. 139. Vase with arched handles embellished with life forms in high relief — ¼.

or what seem to be intended for serpents, modeled in the round and rather imperfectly attached, and in the other with a pair of grotesque human figures set against the base of each end of the handle.

Typical vessels of this class are in many cases mounted upon tripods, but, for convenience of description, these are classed with the succeeding group, which consists mainly, if not entirely, of the same variety of ware.

To recapitulate, the striking characteristics of this group are the uniformity of size, shape, and handles, the rude finish and ruder ornamentation, and the very marked evidence of use over fire.

The tripod group.—Closely related in most respects to the group of ware just described is the striking series of vessels here presented. At first glance the resemblances are not apparent, but a careful study renders it clear that the vessels proper correspond closely in both groups. The basins are for the most part made in the same heavy, rudely finished style, the decoration is almost equally rude, and the size and the evidence of use over fire are the same. The strong contrast in appearance is due mainly to the presence of tripod supports in this group. The legs, which constitute such a striking feature, are merely appendages to the bodies of vases already perfect, and are evidently an acquired feature suggested by some change in function or in the habits of the people. In this way we are able to account for the

rather uncouth look observed in so many cases, the legs being too long and too heavy to please the cultured taste; yet in many cases the parts are so adjusted as to give an impression of firmness and strength, united with a goodly share of grace of line.

The legs are very generally modeled to represent animal forms. In a majority of cases the fish was chosen because, perhaps, its shape was suitable or because the fish bore some relation to the use to which the vessel was to be devoted. Lizards and mammals are also seen and the human form occasionally appears. In some cases the animal figure is attached to the upper part of the leg or is perched upon the hip, where that feature is pronounced. The body, or shaft, is hollow and contains pellets of clay, sometimes one only and again a dozen or more, and in order that these may be seen and heard variously shaped slits are cut in the sides or front of the legs. If the animal represented is a fish or lizard the entire body is modeled: the head is placed at the top, the under jaw or neck uniting with the body of the vessel; the tail rests upon the ground, and the fins or legs appear along the sides of the shaft. It should be observed that, while in Chiriqui the whole body of the creature is usually employed in forming the support, in Central America and Mexico the head alone is very generally used, the nose resting upon the ground. In less elaborate forms the legs are plain or have the merest hint of animal form in a node, a notched ridge, or a slightly modified extremity.

Handles are present in a majority of cases and as in the preceding group take the form of loops or represent the forms of animals. The loops are generally attached in a vertical position, connecting the shoulder with the lip of the vessel, and are plain round ropes of clay or consist of two or three cords twisted or plaited together. A few eccentric forms occur and are illustrated early in this section.

The animal shapes are often quite elaborate and appear to bear no relation to the creatures embodied in the legs of the vessel; neither does the position of the handles bear any uniform relation to the positions of the legs—another indication that the latter features are recent acquisitions, since features developed together are uniformly well adjusted.

The rim or lip is generally heavy and flaring, and the neck, which is short and pretty sharply constricted, is decorated with incised patterns and with various applied ornaments in relief. The body is graceful in outline and more or less conical below. As a rule the surface is uneven and but slightly polished and the figures in red are rudely executed, but in the more pretentious pieces much care has been exercised in finishing and painting. Most of the vessels have been used over the fire and still retain the sooty incrustations. This ware comes from a wide range of territory to the north and west of David.

The following illustrations represent some of the more important

pieces and serve to give a partial idea of the range of form, size, and decoration.

I present, first, three vases of rather eccentric shapes, the basins of which are shallow and in two cases are flat bottomed. The handles are of unusual shapes, consisting of modifications of the lip, as seen in the illustrations (Figs. 140–142). Life elements are present in all

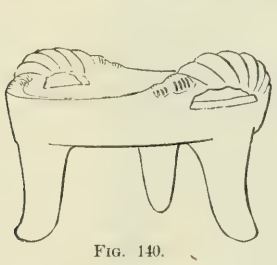


FIG. 140.

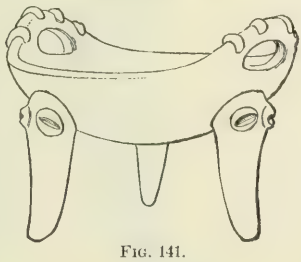


FIG. 141.

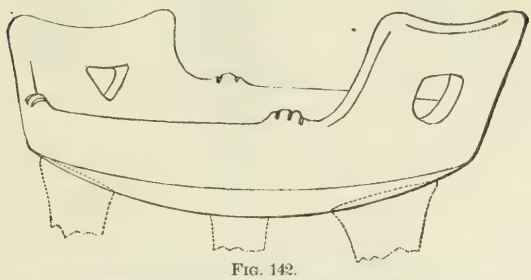


FIG. 142.

Tripod vases with shallow basins and eccentric handles — ¼.

cases in connection with the handles and legs where these are preserved, but they are very meager and so abbreviated as to be identified with difficulty. Incised markings at the ends of the handles represent hands or feet and eyes are affixed to the upper part of the legs. The ware is identical with that of the preceding group.

A representative specimen of the fish legged vessels is presented in Fig. 143. It is one of the most graceful forms in the series and is neatly finished and embellished, but is thoroughly blackened with soot. The handles are formed of twisted fillets or ropes of clay and a narrow, incised, rope-like band encircles the lower part of the neck. Set upon the neck and alternating with the handles are two scrolls neatly formed of small round ropes of clay. The fishes forming the legs are very simply treated. The mouth at the apex is formed by laying on an oblong loop of clay and the eyes are represented by two round pellets set into the soft clay of the head and indented with a slit that gives to them the exact effect of screwheads. A pair of fins—small incised or channeled cones—is placed at the sides of the head and another at the sides of the body. The cavity contains a single ball of clay and the slit is long and wide.

In other examples the fish form is much more elaborately modeled.

The wide mouth exhibits a row of teeth and the body is well supplied with fins. The head in Fig. 144 reminds one forcibly of the catfish.

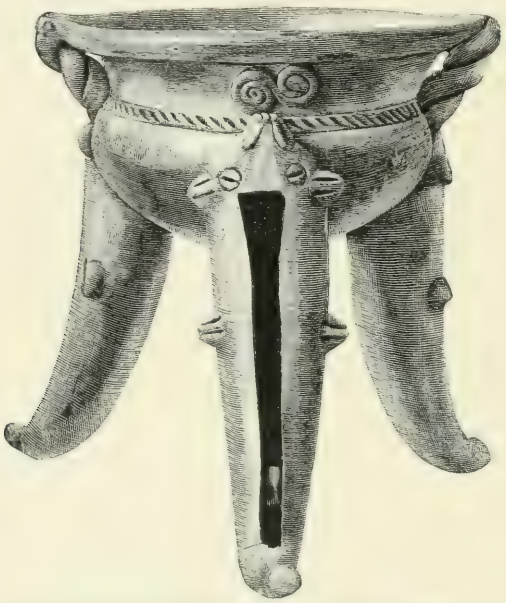


FIG. 143. Tripod vase of graceful shape and neat finish. ⅓.

The snout is furnished with two horn-like appendages; tooth-like features are formed by setting in pellets of clay, and the gills are indicated by a punctured excrescence at the side of the mouth. In

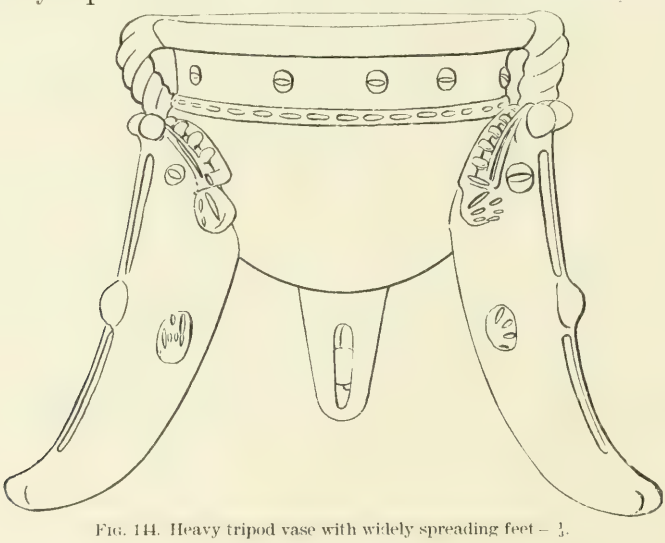


FIG. 144. Heavy tripod vase with widely spreading feet. ⅓.

other cases a high sharp cone is set upon the middle of the head (Fig. 145). It is channeled down the sides, as if meant for a fin.

The process of modeling these heads was about as follows: The upper end of the leg — the head of the fish — was first rounded off, giving the general shape; then parallel incisions were made to represent the teeth, and around these a fillet of clay was laid, forming the lips, which were then channeled with a sharp tool. Nodes or flattened pellets of clay, representing the gills, snout, and eyes, were then laid

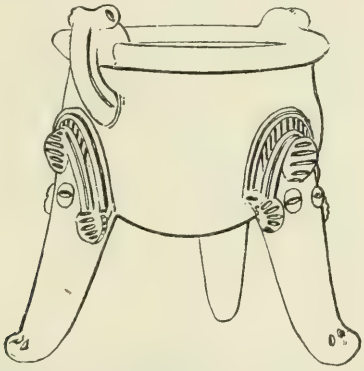


FIG. 145. Neatly modeled vase embellished with life forms and devices in red $\frac{1}{3}$.

on and finished with incision-like indentations. The handles consist of bird-like heads, with protruding eyes and long bills that curve downward and connect with the shoulder of the vase. The body is rudely spotted with red.

A large, uncouth specimen is shown in Fig. 146. The legs are pon-

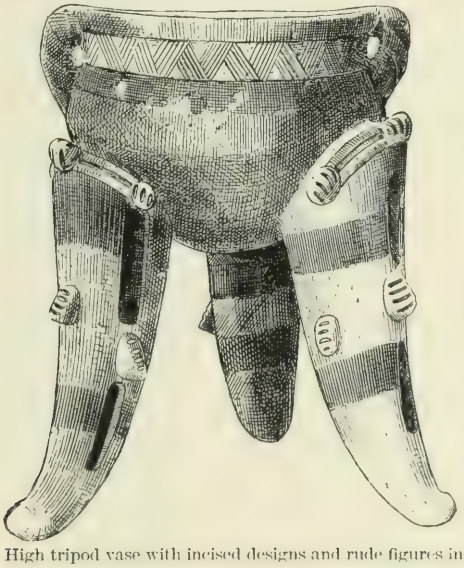


FIG. 146. High tripod vase with incised designs and rude figures in red $\frac{1}{3}$.

derous and are not neatly adjusted to the vessel. A meander pattern of incised lines encircles the neck and the body is rudely decorated with broad red stripes.

There is a general consistency in the use of life forms which is worthy of notice. The fish and other creatures used, although variously conceived and treated, are never confused. When the fish is employed no features suggesting other animals appear and when the heads of other creatures occupy the upper extremity of the leg all the details refer to these creatures with uniform consistency. In Fig. 147 we

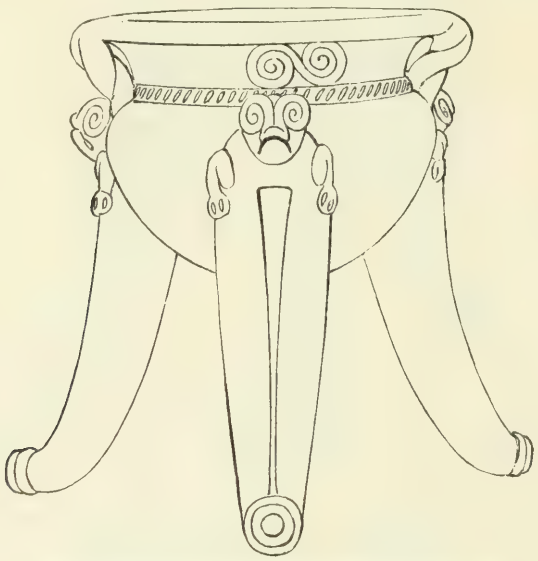


FIG. 147. Handsome tripod vase with scroll ornament — $\frac{1}{3}$.

have an unusually graceful shape, decorated about the neck with scrolls and indented fillets. The legs represent some reptilian form resembling a lizard. The head projects from the hip and is conventionally treated. A round fillet fixed at its middle point to the muzzle of the creature is turned back at the sides of the head and coiled to

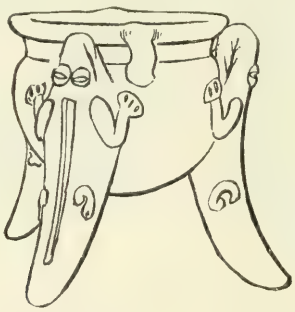


FIG. 148. Vase with lizard shaped legs — $\frac{1}{3}$.

form the eyes. The forelegs are attached at the sides near the top and the recurved terminal point is encircled by rings that stand for the coiled tail.

There is little room for doubt as to the kind of creature represented in the legs of the vase given in Fig. 148. The head, legs, and general

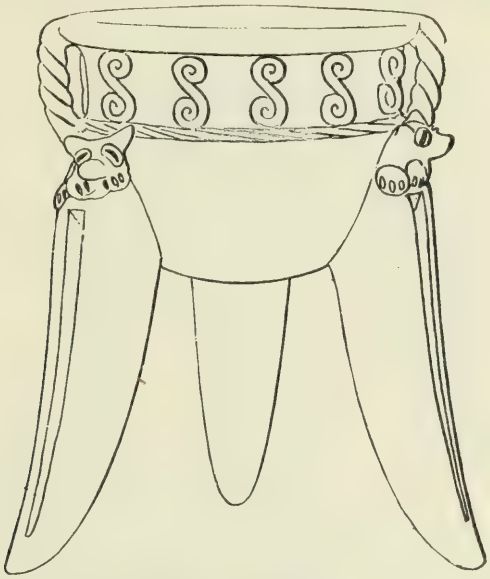


FIG. 149. Vase with scroll ornament—$\frac{1}{3}$.

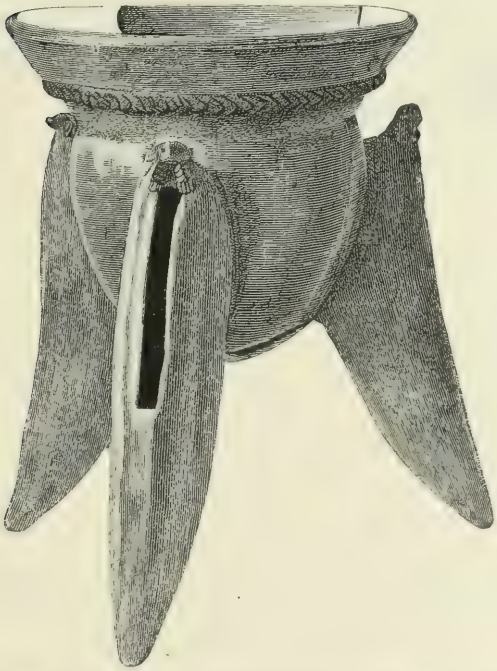


FIG. 150. Large vase with flaring rim and wide spreading legs $\frac{1}{4}$.

shape are characteristic of the lizard. The vessel is small, plain, and neatly finished. In Fig. 149 the legs of the vessel, otherwise quite plain, are surmounted by heads that seem to represent a dog or some like animal. A series of neat vertically placed scrolls formed of round fillets encircles the neck, and below these is a band in relief imitating a twisted cord.

A vase of unusually striking appearance is presented in Fig. 150. It is one of the largest tripods in the collection and is characterized by a high widely expanded lip and a long conical body and by legs of unusual size and conformation. Small animal figures are perched upon the projecting hips. The surface of the vessel is rudely finished and is much blackened by smoke about the upper part of the legs and the body.

A unique use of the animal form is illustrated in Fig. 151, which shows a large fragment of one of these tripods. The figure of an

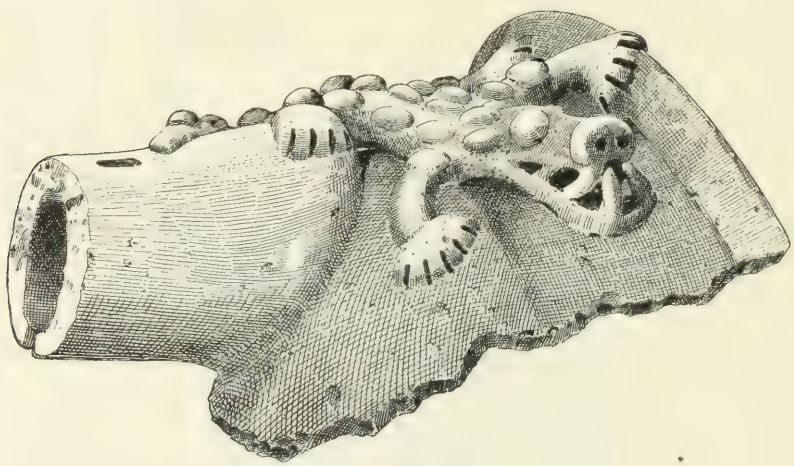


FIG. 151. Fragment of a tripod vase embellished with the figure of an alligator.

alligator, modeled with a great deal of spirit, is attached to the side of the vessel, resting partly upon the leg and extending upward obliquely to the lip. A similar figure upon the opposite side of the same vase is represented as grasping the form of a man or boy in its formidable looking jaws.

The alligator, rarely employed in this group of ware, is freely used in other groups and was probably a creature of importance in the mythology of Chiriqui.

In one case only, so far as I have seen, is the human form employed in the supports of these vessels, and in that case, as will be seen in Fig. 152, the result is extremely grotesque. The shape of the basin is good and the thick, rounded lip and most of the surface are carefully polished. A disconnected meander of incised lines encircles the rather high neck, and parts of the body and its attached features

are painted red. As usual this color was applied along with the slip and in polishing has become much mixed up with it, giving a mottled effect. The handles take the form of curious human-appearing figures

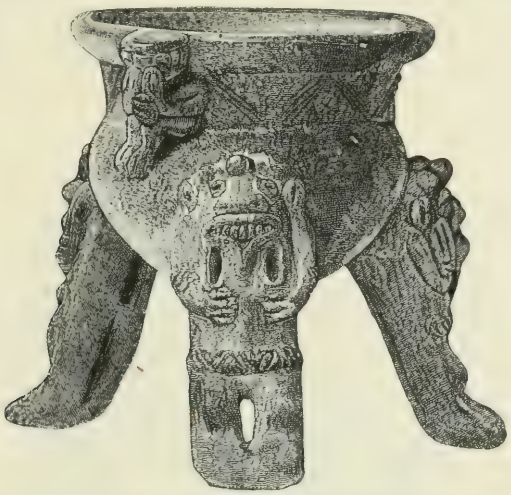


FIG. 152. Vase supported by grotesque human figures — ⅓.

which sit against the constricted neck, their heads supporting the rim and their feet resting upon the shoulder of the vessel. In one case the hands are held tightly against the lower part of the face and in the other they are bound together against the chin by a serpent-like cord of clay. The hollow figures forming the legs of the vase are as grotesque as could well be imagined. There is no head whatever, and the outlandish features are placed upon the front of the upper part of the body. The arms and hands take the conventional position characteristic of the statuary of the isthmian states and the only traces of costume are bands about the wrists and a girdle encircling the lower part of the body.

I add, in Fig. 153, one more example, a large, full bodied vase, which, more decidedly perhaps than any of the foregoing, proclaims its relationship to the preceding group. If the three rather clumsy legs were knocked off there would remain a large beautifully shaped and finished vase, with a constricted but flaring rim not in any way distinguishable from those of the preceding group. The legs in this case are less perfectly adapted to the vessel than in the other examples, as if the potter, skillful in modeling the vessel, had only recently undertaken to add the tripod. The slit in the outer face of the leg is unusually wide and the inclosed ball is three-fourths of an inch in diameter. The most remarkable feature of this vessel is the pair of unique figures affixed to the upper surface of the body near the lip, and which would seem to be intended to represent semihuman monsters. The arms and legs are contorted and serpent-like in appearance and terminate in most cases in heads of serpents instead of

in hands and feet. The attitude is expressive of agony or horror. It seems to me probable that, contrary to the rule in primitive art, these strange figures do not embody any well defined or serious conception, but are rather exhibitions of the fancy of the potter. They occupy small unpainted panels, which are finished in neat incised patterns. The remaining surface is a bright red.

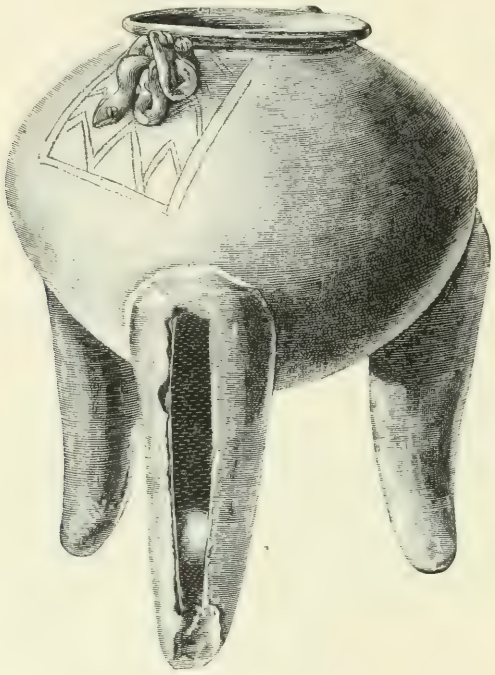


FIG 153. Round bodied vase embellished with figures of monsters—¼.

It may be noted, in recapitulation, that these vases, although elaborately modeled and often well finished, are rudely decorated and very generally show use over fire; that the legs, though often graceful and well proportioned, are in many cases clumsily adjusted to the body, giving a decidedly unsatisfactory result as a whole. This ware was devoted to domestic uses, or, if otherwise, in all probability to the burning of incense. Animal forms are freely employed, but in a rather rude way. The fish form is more generally used than any other, and is in all cases embodied in the legs of the vessel, the head joining the body of the vessel and the tail resting upon the ground. These representations exhibit all grades of elaboration from the fairly well modeled to the merest suggestion of animal character—any one feature, as the mouth, the eye, the fins, or the tail, being alone a sufficient suggestion of the creature to satisfy the potter and keep alive the idea of the fish. Other animal forms are employed in modeling the legs, and exhibit equally varying degrees of elaboration, and it is

worthy of especial note that creatures are not confused or confounded, so far as I can discover, at any stage of the simplifying process — that a fish is still purely a fish if nothing is left to represent it but a node or an incision. There is no apparent relationship between the animal forms forming the legs and those attached to the body or to the rim of the vessel.

The pottery of the two groups already presented exhibits characters so uniform throughout that there need be no hesitation in placing them together as the work of one community and of one period of practice of the art; but between these groups and those that follow there is a wide gap. The differences are so marked that, if they had come from widely separated localities, very intimate relationships would not have been suggested.

The maroon group.—For the want of a better name I have called the group first to be presented the maroon group, on account of its color. Our collection comprises not more than a dozen pieces of this ware. The locality from which they come is called Los Tenajos by Mr. McNeil, but he has not distinguished them in any way from the other varieties, and I am therefore unable to say whether or not they occur together with others or under identical conditions. In symmetry of outline, diversity of shape, and cleverness of modeling this ware takes a high rank, but there is no painted ornament. The surfaces are usually well polished, and all exposed parts have received a coat of purplish maroon colored paint. The paste contains a great deal of fine sand, and is yellowish upon the surface

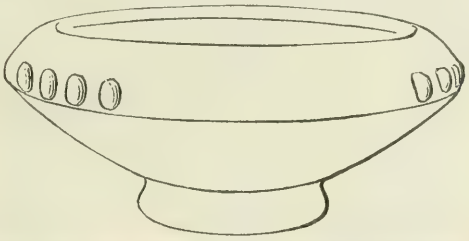


FIG. 154. Cup with incurved rim and life form ornamentation—½

FIG. 155. Cup with widely expanded rim and constricted neck—½.

and generally quite dark within the mass. Considering the small number of pieces, the scale of form is remarkably varied. There are plain bowls with incurved rims and with flaring rims, vases with

round bases, with annular stands, and with tripods, and life forms wholly unique. Perhaps the most usual form is that shown in Fig. 154, which represents a small cup with incurved rim and a narrow annular base. The shoulder is embellished with three groups of small nodes, of four each, which refer to some animal form. In other similar vases the form of the creature is given in more realistic guise. A larger vase, similar to this in most respects, has a rounded contour and incurved lip. The periphery is supplied with four plain nodes. Another, shown in Fig. 155, has a wide recurved rim, a character seen to equally good advantage in some of the following figures. In

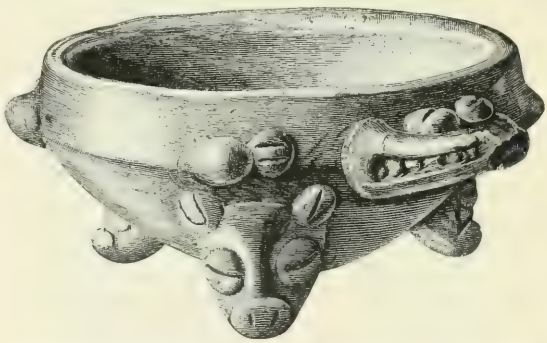


FIG. 156. Small tripod cup with animal features in high relief. ½.

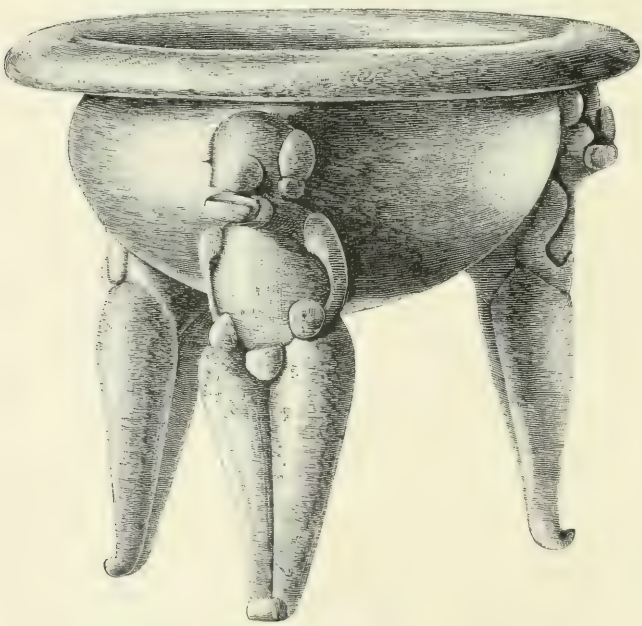


FIG. 157. Handsome vase supported by three grotesque figures—½.

the small vase represented in Fig. 156 the treatment of animal forms in connection with the body of the vessel is shown to good advantage.

The head, legs, and tail of what is probably intended to represent an alligator, modeled in the round, are attached to the periphery of the basin, and heads of some mammal are used for legs.

A most interesting tripod is shown in Fig. 157. The bowl is beautifully modeled, is symmetrical, and has a flaring rim, rounded and polished on the upper surface and drooping slightly at the outer margin. The body is hemispherical and is supported by three grotesque anthropomorphic figures that strongly remind us of the "mud head" masks used in one of the dances of the Zuñi Indians. The head is a rounded ball, upon which pellets of clay are stuck to represent the features. The arms are set against the sides of the body, as in other isthmian specimens, the hips are excessively large, the legs straight, and the feet small and united to form the foot of the vessel. Nearly the entire surface is finished in a dark purplish red paint, which appears to have been polished down as a slip. A companion piece is considerably smaller and the supporting figures are very grotesque and somewhat crouched, as if bearing a very heavy weight.

A number of large basins or caldrons, collected in Chiriqui, and fragments of vessels of extraordinary size resemble this ware in material, color, and finish. The rims of the larger pieces are upwards of an inch thick and the walls are in cases three-fourths of an inch thick. A number of large vessels of similar ware now in the National Museum were collected in Costa Rica and Nicaragua.

The red line group.—The group of vessels to which I have given this name is represented by about a dozen specimens, which indicate a wide range of form and exhibit a number of unique characters.

The localities from which they are derived extend from 8° 20′ to 8° 40′ north latitude and from 82° 40′ to 82° 50′ west longitude.

The paste is of about the usual composition, but takes a variety of tints on burning, a light gray orange prevailing. The finish of the surface is about the same as in other groups. The decoration consists of life forms and their conventional representatives in relief and of carelessly executed geometric designs, the pigment used being a bright, sienna-like red.

As will be seen by reference to the illustrations, the forms are varied and pleasing, but for the most part repeat outlines common to other groups. The handles, single or in twos, are upright loops, and the tripods are in nearly all cases looped or annular, an unusual feature in other groups.

I present three illustrations, two of which were given in outline in the introductory pages. The first (Fig. 158) has a well proportioned, somewhat globular body, supported by three legs formed of looped bands of clay. On the shoulder are two small animal forms, probably meant for frogs. The spaces between these are occupied by panel-like arrangements of red lines. The surface is yellowish gray in color, excepting where blackened in the baking. The paste has

cracked in firing, a feature observed in a number of pieces belonging to this group.

A unique piece is represented in Fig. 159. The single handle is a

FIG. 158. Vase decorated with figures of frogs and devices in red—$\frac{1}{4}$.

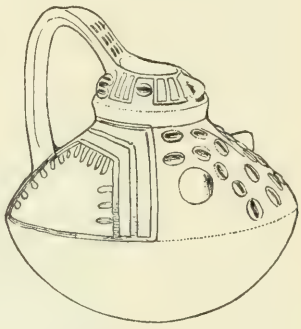


FIG. 159. Vase of unique shape and life form ornamentation—$\frac{1}{4}$.

high projecting loop and connects with the margin of the orifice, which rises to meet it, and with the lower part of the shoulder. An animal form, apparently anthropomorphic, is embodied in this vessel. The upper part of the vessel, separated by a slight constriction from the body proper, represents the head of the creature, the nose, mouth,

FIG. 160. Two handled vase with life form and linear decoration—$\frac{1}{4}$.

and eyes appearing on the front and the ears at the sides. A few incised lines seen upon the inner surface of the handle stand for the hair. Upon the shoulder are two sharp nodes, standing for the breasts, and between these are markings that represent a necklace. A rude design in red lines covers the upper surface of the body.

A graceful shape is illustrated in Fig. 160. The paste is a grayish orange on the surface and is rather dark within the thicker portions of the walls. The under surface is much blackened by use over fire. An interesting feature is seen upon the handles at the highest point of the loop. Instead of the single indented transverse fillet observed in similar forms in other groups, we have two such features, set about an inch apart, and between them are two indented nodes which stand for eyes, and a number of indentations within the space refer to other features of the animal suggested. Upon the shoulder and collar of the vessel are carelessly drawn geometric patterns in red lines.

The white line group.—One group of vases, of which we have but four pieces, is characterized by the use of a whitish pigment in decoration. Not one of the collections that I have seen is well supplied with this class of ware, and hence little can be said of its varieties of form and ornament. All are tripods, but the shapes of the vessels vary considerably. Two small pieces are from latitude 8° 40′ north and longitude 82° 32′ west. One of these is shown in Fig. 161. They are small, rather carelessly finished tripods, with narrow necks and

FIG. 161. Small tripod vase with animal figures in white. ½.

flattened bodies. The inner surface of the orifice and the under side of the body are painted a dull red. The remainder of the surface is a warm reddish gray, the color of the slip and the paste. The legs in the piece figured represent some small creature with a rabbit-like face and a body which tapers gradually to the base. Two feet are placed near the middle of the body, which is striped transversely with white lines. A white collar crosses the neck and the eyes are white dots. The upper surface of the vase is embellished with two animal figures, executed in a white earthy pigment. They may refer to the alligator,

but the drawing is too conventional to admit of full identification. The companion piece is a little larger, and the upper surface is decorated with three groups of broad white stripes, bordered by rows of dots, which extend from the base of the neck to the periphery of the body. The legs are similar to those of the other piece. The little animal figure fixed to the upper end or hip is identical with that seen in the following illustration.

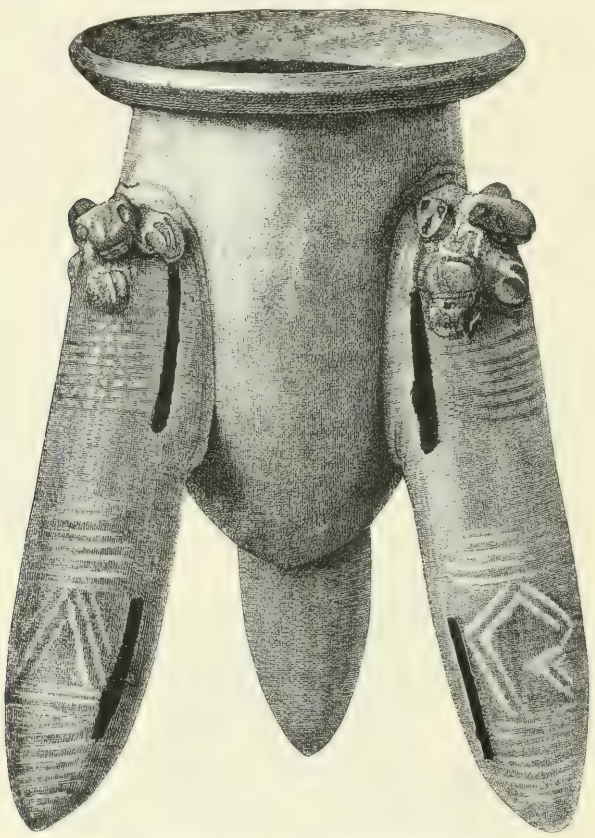


FIG. 162. Shapely vase with designs in white paint – ¼.

The large tripod vase presented in Fig. 162 is distinct in many ways from anything in the collection and is remarkable for symmetry of form and neatness of finish. The body is a long, symmetrical cone and the legs are long, straight cylinders, neatly rounded off to a point below. A thick rim projects at a sharp angle and is rounded up toward the margin. The legs are hollow, and through two pairs of lateral slits a number of small pellets can be seen, which rattle when the vase is moved. Rudely modeled little animals, with erect ears, large feet, and conical tails, are fixed to the upper end of the legs. The ground color, the slip, and the paste are of a reddish

gray cast. The greater part of the surface seems to have been painted red, but the vase has been used over fire to such an extent that little of the original color remains. The body and the legs have been decorated with geometric patterns in a whitish pigment that can be scraped off like indurated clay. The little animal figures were also painted white. A vase very similar to this, from which the legs have been removed, and the surface smoothed down, has a longer and more graceful body and a similar rim. Another piece, exhibiting similar yet even more strongly marked characteristics of shape, belongs to the collection of Mr. J. B. Stearns.

The lost color group.—In number of specimens this group is second to none, excepting perhaps that given under the head of terra cotta ware. Nine-tenths of the pieces may be classed as bottles, which have rather short, wide necks and globular bodies, slightly conical below and in cases flattened above. They range in size from one inch to nearly a foot in height, but the average capacity is not above a pint. Aside from the bottles there is a wide range of shapes. There are shallow bowls and various complex and compound forms. Animal forms are associated with all classes of vessels. Tripod supports are limited to rather modest proportions, and handles, although often present and greatly varied in style, do not constitute an important feature. These vessels are remarkably well preserved and exhibit few traces of abrasion by use or of blackening over fire. The paste is fine grained and usually of a light yellow gray tint throughout.

The surface was finished either in a light colored slip or in a strong red pigment. In some cases the light tint was used exclusively and again the red covered the entire surface, but more frequently the two were used together, occupying distinct areas of the same vessel and forming the groundwork for decorative patterns in other colors. They were usually polished down with very great care, giving a glistening surface, upon which the markings of the tool can still be seen.

I have already described the methods of decoration, but may review them briefly here. The bright red color, which forms such a prominent and pleasing feature, is, as stated above, only a ground tint and is not used in any case in the delineation of design. The actual patterns, so varied and interesting, were worked out in a pigment or fluid now totally lost, but which has left traces of its former existence through its effect upon the ground colors. In beginning the decoration, a thin black color, probably of vegetal character, was carried over the area to be treated, and upon this the figures were traced in the lost color. When this color (if it was indeed a pigment, and not merely an acid or "taking out" medium) disappeared, it carried with it the black tint beneath, exposing the light gray and red tints of the ground and leaving the interstices in black. The interstitial figures thus formed are often of such a character as to be taken for the true

design. In examining the decoration of this ware it is essential that this fact should be kept in mind, as otherwise great confusion will result.

The nature of the materials employed cannot be determined. Applied to the polished surface, they were easily removed. The black ground tint is now easily rubbed off and in most cases is much injured by handling or by contact with the soil. The lost color may have been similar to the white, argillaceous pigment used by the Aztecs, which has in many cases partially or wholly disappeared, leaving its marks upon the ground either by deadening the polish or by removing portions of the slip and the paste upon which it was laid, presenting the ornament in intaglio.

The designs are infinitely varied in appearance and arrangement, yet are far from having a mixed or heterogeneous character. It is probably our lack of knowledge of the origin and history of the elements and their derivations that causes confusion. Both geometric and imitative elements abound and are blended in perfectly graded series. The treatment of geometric figures is peculiar to Chiriqui and in many respects is peculiar to this group of ware. Classic forms, such as the meander, the scroll, and the fret, rarely occur and are barely recognizable. It appears from a close study of all the work that motives derived from nature have greatly leavened the whole body of decoration. This matter will receive attention as the examples are presented and will be treated with greater care in a succeeding section.

Plastic decoration, aside from the life forms so commonly associated with the body of the vase and with the handles and legs, is not of importance. The high degree of polish required in this ware tended to simplify all relieved features.

The presence of life forms in relief has produced important modifications in the appearance and the arrangement of the painted devices, and in many cases there is a manifest correlation between the plastic and the painted forms: as, for example, when the body of the vase was thought of as the body of the animal, the extremities of which were placed upon its sides, the colored figures carried out the idea of the creature by imitating in a more or less conventional way the markings of the body. This will be understood through reference to the examples presented in the following pages.

I will present, first, a series of bottles, selecting at the beginning those decorated in the more purely geometric style and gradually approaching those upon which animal forms are treated in a literal manner. The few pieces selected for illustration are totally inadequate to the proper representation of the group and must be regarded only as average specimens, more or less typical in character.

I give first a number of examples in which the decorative devices are arranged in horizontal zones. In Fig. 163 broad bands of orna-

ment, consisting of scalloped and plain lines, encircle the neck and the body of the vessel. In finishing this piece the whole surface was painted a rich red and highly polished; then a black coat was applied, covering the body from the lip to the base of the design; and finally the delineating fluid was applied, removing the black, as shown in the narrow lines, the sharply dentate bands, and the broad, plain band

FIG. 163. Small red bottle with horizontal bands of ornament consisting of plain and scalloped lines — ½.

FIG. 164. Small red bottle with encircling geometric devices — ½

between. The second example (Fig. 164) varies somewhat in shape and design, but is identical in color and manipulation. The dark figures are merely the interspaces, although they appear at first glance to have been intended for the design proper.

In a numerous series of vessels the decorated bands are divided into compartments or panels, often four in number, which spaces are occupied by lines and figures of greatly diversified characters. In the example shown in Fig. 165 the ground color of the principal zone is in the light yellow gray tint of the slip, the remainder being red. This lends brilliancy to the effect.

In the vase shown in Fig. 166 the treatment is in a general way the same, but the compartments are triangular and are separated by lines that form a disconnected meander. An additional example is given in Fig. 167. Here the principal zone is expanded to cover the whole

FIG. 165. Bottle with zone occupied by geometric devices — ½.

FIG. 166. Bottle with broad zone containing geometric figures - ½.

upper surface of the vase, which was finished in the light colored slip to receive it. The principal lines are arranged to give the effect of rays when viewed from above, but as seen in the cut they give the effect of a carelessly connected meander. The groups of lines are

bordered by series of dots. A great number of pieces are painted in this style. The effect is varied by altering the shape of the interspaces or by modifying the number and relationship of the lines, dots, and figures.

FIG. 167. Bottle with decoration of meandered lines. ½.

Somewhat similar also in general effect to the last example is the work upon another important series of vases. Instead of the simple meandered or zigzag arrangement of parts, two of the dividing

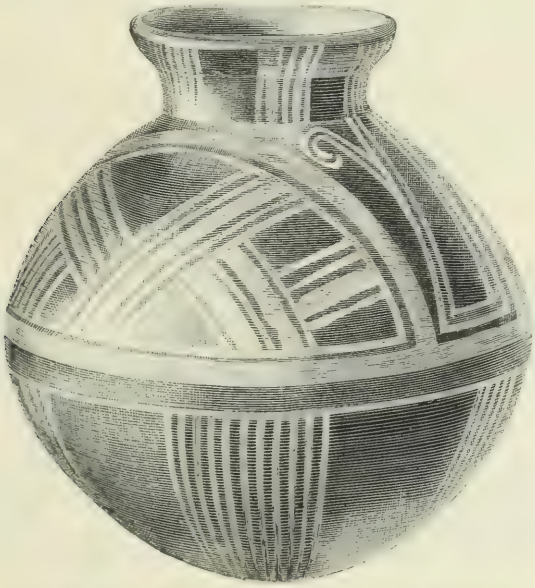


FIG. 168. Bottle with arched panels and geometric devices. ½.

lines of the zone run tangent to the neck of the vase on opposite sides, forming arched panels and leaving upright panels between.

In the example presented in Fig. 168 the arched areas are filled in with lattice-like arrangements of lines. In others we have dots, checkers,

FIG. 169. Bottle with arched panels and elaborate devices — ½.

and varied geometric combinations, and in very many cases the figures are derived from life forms. The same may be said of the devices that occupy the spaces between the arches. The piece shown in Fig. 169 exhibits a somewhat more elaborate treatment, but the motives and arrangements are much the same. These vessels are peculiar in the treatment of the ground. The entire surface is red, with the exception of narrow bands of light ground color, which outline the arches and encircle the periphery. In other cases these bands are red, the remainder of the ground being light. Series of lines are drawn from the lower border of the zone to the center of the base of the body.

In a small group of vases we have a radiate ornament within the arches and in a few cases the arched lines are continued down around

FIG. 170. Vase with rosette like panels — ½.

FIG. 170*a*. Ornament from vase shown in Fig. 170.

the base of the vessel, forming vertical circles in which rosette-like designs are formed by repeating the radiate figures in an inverted

position below the peripheral line. The elaboration in these circular inclosures is very remarkable, as will be seen by reference to the three

FIG. 171. Vase with rosette-like panels — ¼.

FIG. 172. Vase with rosette-like panels — ¼.

examples given in Figs. 170, 171, and 172. In the first case the peripheral line is a red band nearly one-half an inch wide and the rays appear in groups above and below it. Within the four broader black rays (Fig. 170*a*), which are the interspaces or remnants of the ground, groups of lines have been drawn, in most cases curved at the inner ends like an opening frond and accompanied in all cases by series of dots. An examination of a number of vessels shows various degrees of convention. It is clear, however, that these devices, showing curves, hooks, and dots, are not of technical or mechanical origin, but that they refer to delineative originals of which they are survivals; but we must remain in the dark as to what the originals were or what was the precise nature of the idea associated with them in the mind of the decorator. Another question refers to the arrangement of the parts of the design in the five preceding figures. The distribution of the designs is a matter of great interest, and much may be learned from a close study of these specimens.

Horizontal zones appear in the ceramic decoration of all countries, and result, no doubt, from technical causes; but the division of zones into compartments of peculiar shape is due to other influences. I believe the peculiar arched arrangement here seen results from the employment of plastic features, such as handles or life forms. The ancient races were accustomed to conceive of the vessel as the body of an animal, an idea originating in the association of mythologic conceptions with art. The head and the tail of the particular creature thought of were attached to opposite sides of the vase and consequently interfered with the original zonal arrangement of the design where it existed, or where it did not exist the sides were filled with devices representing the markings of the creature's body. The decoration now consisted of four parts, two in the round or in relief and two in color, the former occupying small areas and the latter wide areas, as

seen in Fig. 173. The same result would spring from the use of two handles, such a common feature in this ware. The lateral spaces reached from the periphery to the base of the neck and were most

FIG. 173.

FIG. 174.

FIG. 175.

Theoretical origin of the arched panels.

readily and naturally separated from the plastic features by lines extending across the shoulder tangent to the neck and forming arches (Fig. 174). In time the plastic features, being difficult to manage, would gradually decrease in boldness of modeling and finally disappear, leaving a space upon which the life form could be symbolized in color (Fig. 175). Now it happens that in this collection we have a series of examples illustrating all stages of this change, the first, the middle, and the final steps being shown in the above figures.

FIG. 176. Vase decorated with conventional figures of alligators — ½.

In multiplying these vessels the original forms and associations of decorative features are necessarily to some extent lost sight of; the panels change in shape, number, and relationships; and devices originally appropriate to particular spaces are employed indiscriminately, so that the uninitiated see nothing but confusion. All devices are delineations of or have more or less definite reference to the creature or spirit associated with the vessel.

I will now pass over the many hundreds of pieces with designs too conventional to furnish a clew to the original animal forms, yet still suggesting their existence, to those in which the life forms can be traced with ease or in which they are delineated with a much nearer approach to nature. The manner of introducing life forms into the panels of the encircling zones is illustrated in the following figures. In the vase shown in Fig. 176 there are four panels, two

FIG. 177.

FIG. 178.

Portions of decorated zones illustrating treatment of life forms.

short and two long, separated by vertical bands. The short panels are black, but the long ones are occupied by rudely drawn figures of alligators, some of which are very curiously abbreviated. At the right hand in the cut we have simply the head with its strong recurved jaws and notched crest. The principal figure at the left is a two headed alligator, the body being straight and supplied with two feet. The ground finish of the decorated band is in the light gray tint and the alligator figures and vertical septa now appear in that

FIG. 179. Vase decorated with highly conventional life forms—$\frac{1}{4}$.

color. The ground of the remainder of the surface is red. It will be seen that in this case the panel outlines are rather elaborate and that the neck and base are striped in a way to enhance considerably the beauty of the vessel. Additional examples of animal devices are given in Figs. 177 and 178. The significance of the curious figure

seen in the first is not easily determined, although we do not hesitate to assign to it an animal origin. There is a suggestion of two sitting figures placed back to back between the upright serrate lines. In the second piece, which is from another vessel, the space between the serrate lines is occupied by a sketchy figure which, in the phraseology of heraldry, may be likened to a monkey rampant.

FIG. 179*a*. Design from vase shown in Fig. 179.

In Figs. 179 and 180 I present very interesting examples in which the arched panels are used. In the first the compartments are occupied by a favorite Chiriquian motive, which consists of groups of

FIG. 180. Vase decorated with highly conventional life forms—$\frac{1}{4}$.

lines curled up at one end like unfolding fronds. The whole group represents a very highly conventionalized animal figure (Fig. 179*a*). The devices occupying the upright panels take the place of the animal heads shown in several preceding figures. In the arched panels shown in Fig. 180 we have the frond-like motive treated in a man-

ner to make it pretty certain that a reptilian form is intended. These figures are fully and systematically presented in a succeeding section.

Many of these globular vases are unusually handsome. The polished ground is red or is varied with stripes or panels of the whitish slip. Over this ground the whole surface was painted black and then the lost color was employed to work out the design. The coiled figures were produced by drawing the lines in the lost color. The interspaces were then roughly gone over with the same pigment in such a way as to leave the figures inclosed within rather uneven black borders. The presentation of these ornaments brings me naturally to the consideration of a number of very puzzling forms which, if taken alone, must inevitably be referred to vegetal originals. In Fig. 181 we have a handsomely shaped vessel, finished in a polished red ground and decorated in the usual manner. In the main zone—here

FIG. 181. Vase decorated with highly conventional life forms—½.

rather high up on the vase—there is a series of upright figures resembling stalks or stems with scroll-like branches springing from the sides. The stalks are probably the septa of the panels and the leaves are the usual reptilian symbols. About the widest part of the body of the vase is a band of ornament probably representing an animal.

A still more remarkable ornament is shown in Fig. 182. The decorated zone of the vessel from which this is taken is divided into three panels, each of which contains stem-like figures terminating in flower shaped heads and uniting in a most remarkable way animal derivatives and vegetal forms. I am inclined to the view that here, as in

the preceding case, the resemblance to a vegetal growth is purely adventitious.

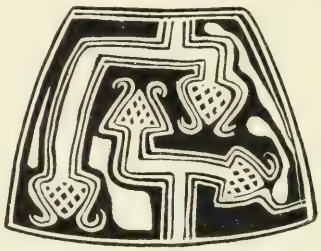


FIG. 182. Decorated panel with devices resembling vegetal growths, but probably of animal origin — ½.

In striking contrast with the globular forms just given are the angular outlines presented in the following illustrations. The first is flattened above, the body being much expanded horizontally and

FIG. 183. Example of vase of unusual shape — ⅓

FIG. 184.

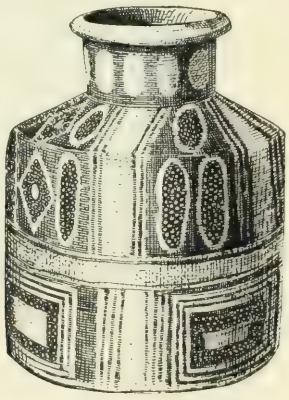


FIG. 185.

Examples of vases of unusual shapes ⅓.

having a sharp peripheral angle. Upon the shoulder, occupying the places of and probably standing for animal heads, are two cruciform

nodes, about which the scroll-like decorations of the upper surface are coiled. We see by this that in the mind of the potter a correlation existed between the plastic and the painted devices even in these conventional decorations. The second illustration represents a neatly finished bottle, with upright sides and conical base, upon the shoulder of which minute animal figures are perched. The painted design is nearly obliterated. The third example is unique. The sides are upright and the bottom is flat. The ornament occupies the entire surface and is divided into two sections or zones by a red band about the middle.

Complex and compound forms are comparatively rare. A double vessel is shown in Fig. 186, and a second, varying somewhat from the

FIG. 186. Double vessel with high arched handle ¼.

first in shape and ornamentation, is presented in the succeeding figure. Vessels of this form are always small, but are neatly constructed and finished with much care. The strong handles are more or less arched and connect the inner margins of the two lips. The bodies of the twin cups are closely joined, but the two compartments are not connected.

FIG. 187. Double vessel with arched handle ¼.

It seems impossible to present a satisfactory series of the plastic features characteristic of this group of products without extending this paper inordinately. Handles, legs, and life forms are varied and interesting; they are not so boldly treated, however, as in some of the

other groups. This is a result perhaps of the unusual degree of polish given to all parts of the surface preparatory to the application of designs in color, the processes tending to subdue and simplify the salient features.

With reference to life forms it has already been pointed out that the painted figures generally imitate or typify animal forms, and it is important to note that these figures are in very many cases used as auxiliaries to plastic features in the development of particular conceptions. This is shown to advantage in Fig. 188, which illustrates a small, well formed bottle, having two large human-like heads attached to opposite sides of the body. There are no other plastic features, but the heads are supplied with arms and legs, rudely expressed in black lines, which are really the interspaces of the lines drawn in the lost color. These painted parts occupy the zone usually devoted to decoration and, as will be seen by reference to the cut, resemble closely the radiate or meandered figures seen in vases of the class shown in Fig. 167. The arms are joined to the lower part of the head and extend upward to the neck of the vessel, where they terminate in rudely suggested fingers. Rising to the right and left of the arms are legs terminating as do the arms. A double row of dots is carried along each member, and thus we have a suggestion of

FIG. 188. Vase embellished with life forms, heads in relief and other parts in color — ½.

the relation of the dots and dotted lines, seen in more highly conventional forms, to the markings of the creature represented or symbolized. The grotesque faces are covered with lines which follow the forms as if imitating markings upon the skin. Another example, equally suggestive, also employing an animal form, is shown in Fig. 189. It is a cup, mounted upon three feet, which has attached to one side the head of a peccary, modeled with more than usual skill. The ears of the animal appear at the sides of the vessel and the tail is opposite the head. The lines and dots seen upon the head are carried along the sides of the vessel as far as the ears and un-

doubtedly represent the markings of the animal's skin. Behind the ears the markings are different in character and purely geometric. A view of the under side of the vessel is shown in Fig. 190 and illus-

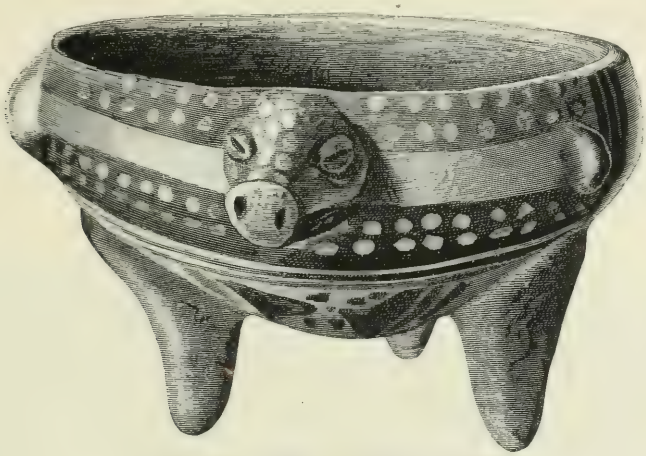


FIG. 189. Vase modeled to represent a peccary—¼.

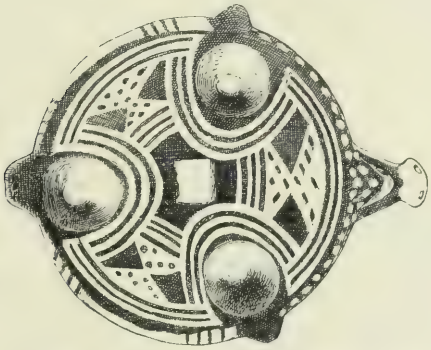


FIG. 190. Under surface of vase shown in Fig. 189.

trates a treatment characteristic of the tripod vases of this class. In other cases, instead of fixing the head of the animal upon one side

FIG. 191. Small vessel with human figures in high relief and geometric color decoration—¼.

and other members of the body upon other sides, two heads, or two complete creatures, are placed opposite each other.

I present next (Fig. 191) a piece in which there is no recognizable relationship between the painted and the plastic features. It is a small tripod cup with upright walls, upon which two characteristic Chiriquian human figures, male and female, are fixed. The painted figures upon the sides of the vessel are geometric, but refer possibly to some character or attribute of the modeled figures or are the survivals of figures belonging to vessels of this shape or style before the life forms were associated with them. The legs, however, so far as can be determined, are not related to the human motive, as they are modeled and painted to imitate the heads of alligators.

I shall now present a few shallow bowls or pans mounted upon tripods. They vary in dimensions from a few inches in diameter to a foot or more and are strongly made, symmetrically formed, and neatly finished. The polished surfaces are mainly red. The designs were executed in the usual way in the lost color, upon a black ground, and are confined chiefly to the exterior surface. The alligator is the favorite motive, and in a number of cases is quite graphically, although still conventionally, rendered. As in the preceding examples, the animal heads represented in the legs do not always correspond to the creatures embodied in the painted decoration.

In Fig. 192 we have a representative example of moderate size and ordinary finish. The decorated band is divided into panels, three of which are long and contain figures of the alligator. The other three

FIG. 192. Tripod cup, with figures of the alligator—$\frac{1}{4}$.

are short and are filled with conventional devices, related perhaps to that animal. The legs are apparently intended to resemble the heads of alligators. A large piece, nearly twelve inches in diameter, is very similar in shape and decoration, but the legs resemble puma heads.

The specimen shown in Fig. 193 is extremely well made and differs decidedly from the preceding. The sides are upright and the lip is recurved and thick. The legs represent some animal form with thick body, eyes at the top, and a tail-like appendage below that turns up and connects with the side of the body. The form of the bowl is symmetrical and the surface carefully finished and polished. The exterior design is divided into panels, as in the preceding case; the figures are simple and geometric. The inside of the upright portion of the wall is decorated with vertical lines and bands and the bottom is covered with an octopus-like figure, now partially obliterated.

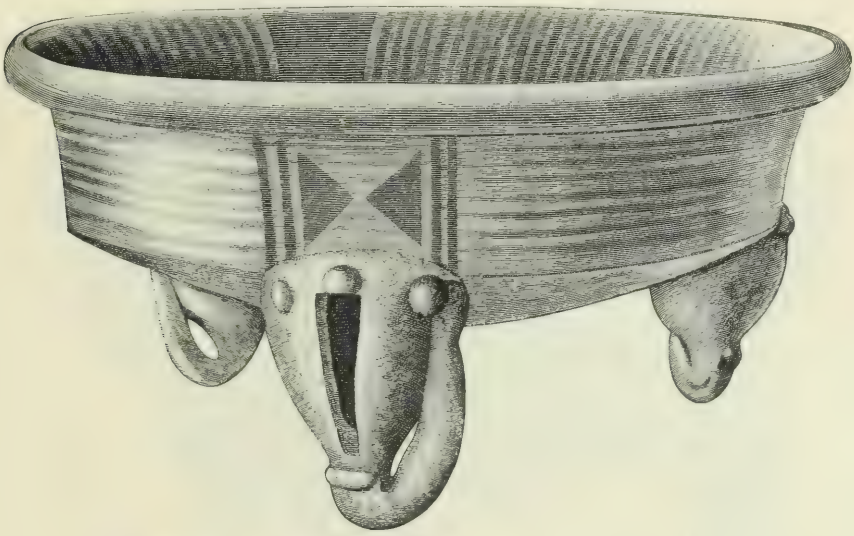


FIG. 193. Large shallow tripod vase, with geometric decoration.

The remarkable example shown in Fig. 194 illustrates a number of the points suggested in the preceding pages. It is a large bottle of the usual contour and color, mounted upon three high legs, which are slit on the inner surface and contain movable balls of clay. Two handles, placed at opposite sides of the neck, represent human or anthropomorphic figures. These figures and the neck and base of the vessel were finished in the red slip. The broad zone extending from the neck to some distance below the periphery was finished in the gray slip, with the exception of the frames of two panels beneath the handles and the foundation lines of two large figures of alligators, which are in red. The surface, when thus treated, was well polished and then a coat of black was laid upon it, and upon this details of the designs were drawn in the lost color. The figures of the alligators exhibit some striking peculiarities. The hooked snout, the hanging jaw, the row of dotted notches extending along the back, and especially the general curve of the body are worthy of atten-

tion. These features are seen to better advantage in the series of vases presented in the following section.

Belonging to this group are many whistles, needlecases, and rattles, all of which are described under separate headings upon subsequent pages.

FIG. 194. Large bottle shaped vase, with high tripod and alligator designs. ¼.

The alligator group.—The group of ware to which I give the above name is perhaps the most interesting in the collection, although numerically inferior to some of those already presented. Its decoration is of a very striking character and may serve to throw much light upon the origin and evolution of certain linear devices, as it illustrates with more than usual clearness the processes of modification.

I will first present a representative series of the vessels, in order that they may in a measure tell their own story; yet it is not possible with-

out the direct aid of a full series of the objects themselves to convey a clear and comprehensive notion of the metamorphoses through which the forms and decorations pass.

This group, like that last described, is composed chiefly of bottle shaped vases with globular bodies and short, wide necks; but there is no danger of confusion. By placing a series from each group side by side a number of marked differences may be noted. In the lost color group the neck is decided in form, the body is usually somewhat flattened above and is distinctly conical below, and the prevailing color is a rich dark red. In the alligator group the body is more nearly globular and the curves of the whole outline are more gentle; the prevailing color is a light yellowish gray. The reds and the blacks, which are used chiefly in the figures, are confined to rather limited areas.

Besides the bottle shaped vases, there is a limited series of the usual forms, and a few pieces exhibit unique features. The management of life forms is especially instructive. Handles are rare and legs are usually not of especial interest, as they are plain cones or at most but rude imitations of the legs of animals. Shallow vessels are invariably mounted upon tripods and a few of the deeper forms are so equipped. Usually the sizes are rather small; but we occasionally observe a bottle having the capacity of a gallon or more. The materials do not differ greatly from those employed in other groups of ware. The paste is fine grained and light in color, sometimes reddish near the surface, and where quite thick is darker within the mass. A slip of light yellowish hue was in most cases applied to the entire surface. A red ochery pigment was in some instances used in finishing the lip and the base of the body, and occasionally the red pigment was applied as a base, a kind of sketch foundation for the decoration proper. For example, when the alligator was to appear upon the side of the vessel, the principal forms were traced in broad lines of the red color, and these were polished down with the slips When the polishing process was complete, the details of the figure. were drawn in black and in cases partially in red. Black was the chief delineating color, the red having been confined to broad areas, to outlines, and to the enframing of panels. In execution, therefore, there is a decided contrast with the preceding group, and it may be added that there is an equally strong contrast in both treatment and subject matter of the ornament. The motives are derived almost wholly from life forms and retain for the most part features that suggest their origin. The subjects are chiefly reptilian, the alligator appearing in a majority of cases, and hence the name of the group.

I present first a few examples of plain bottles which have no extraneous plastic features. The decorations are arranged in two ways, in zones about the upper part of the body or in circular areas, generally four in number, equidistantly placed about the shoulder of the vessel.

An example of the first style is given in Fig. 195, which represents the largest piece in this group of ware. The form is symmetrical and very pleasing to the eye. The surface is not very highly polished and shows the marks of the polishing implement distinctly over the entire surface. Two black lines encircle the flat upper surface of the rim and the outer margin is red. The neck and a narrow zone at the upper part of the body are finished in a cream colored slip and the body below this is red. The narrow band of ornament occupies the lower margin of the light colored zone and consists of five encircling lines in black, three of which are above and two below a band one-half an inch wide, in which five much simplified figures of alligators are drawn. Besides these figures there are two vertical septum-like bands.

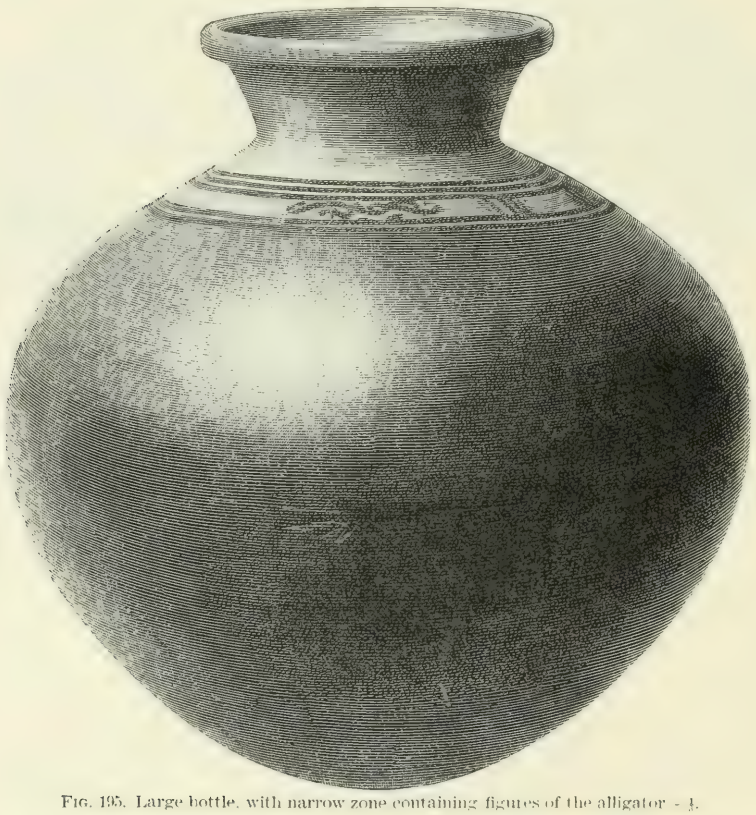


FIG. 195. Large bottle, with narrow zone containing figures of the alligator - ¼.

Each of these consists of three lines bordered by dots, which probably have some relationship with the alligator. The decorated zone of these vessels is divided in various ways into panels, some of which are triangular, while others are rectangular or arched. The latter form is seen in Fig. 196. Five arches, having no border line above, are occupied by abbreviated alligator devices. The number of compart-

ments ranges in other specimens from two to a dozen or more. They are filled in with various devices, to be described in detail further on.

FIG. 196. Vase with decorated zone containing four arched panels — ¼.

A very peculiar form of decoration consists of circular or rosette-like ornaments, such as are shown in Fig. 197. Four slightly relieved nodes an inch or more in diameter are placed upon the shoulder of the vessel. These are encircled by red lines which inclose two black lines

FIG. 197. Vase with four round nodes upon which animal devices are painted — ¼.

each, and within these are peculiar devices in black. Other vessels furnish figures of greatly diversified characters, most of which evidently refer to life forms. A full series of these is given in a subsequent section of this paper, where the origin of the nodes and the manner in which the painted figures probably became associated with them will be fully set forth.

In the series of outlines presented in Fig. 198, we have some of the varieties of form and decoration of both the ordinary bottles and the plainer tripod cups. Each example presents certain features of particular interest. The handsome little bottle (*d*) with the plastic ornament about the neck and the zone of geometric ornament in black and red lines is unique. The double necked bottle is an unusual form and

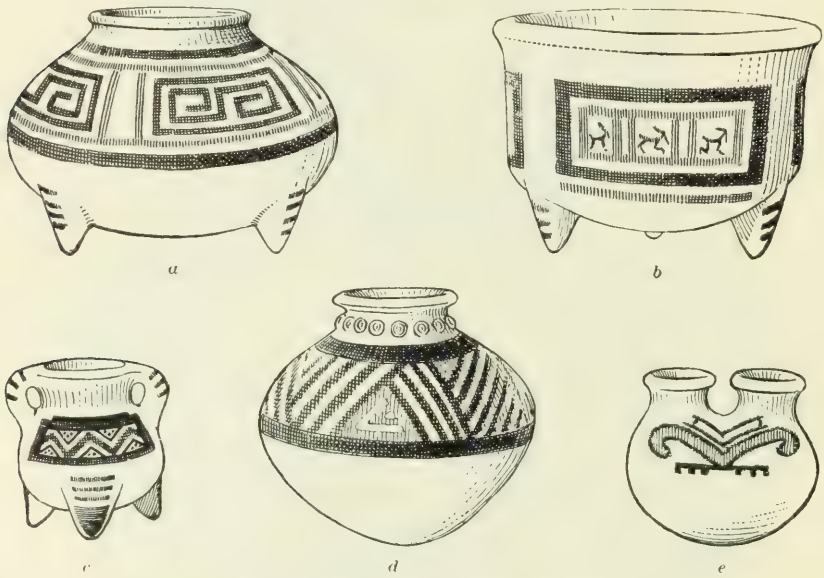


FIG. 198. Vases of varied form and decoration.

its decoration consists of a strangely conceived representation of the alligator. The tripod vases are worthy of close attention: the piece illustrated in *b* has a zone of ornament separated into three parts by vertical spaces, each part being enframed in black. The sections are divided by red lines into three panels, each of which contains a conventional figure of an alligator in black. The piece shown in *a* is unique in its decoration. Four angular fret links in black are inclosed in as many panels, bordered by red and separated by blank spaces. These fret links, as I shall show further on, probably refer to or symbolize the alligator. The legs of the cups are all conical and are marked with short transverse lines in black, which have a direct reference to the markings of the animal to which the vase was consecrated. A careful study of the preceding illustrations leads to

the conclusion that in the mind of the potters there was a close and important relationship between the vessel and the reptilian forms embodied in both plastic and surface embellishment. The series of examples which follow have a bearing upon this point. I shall begin with that in which the creature is most literally rendered.

In Fig. 199 the whole conformation of the vessel is considerably modified through the attempt to perfect the likeness of the alligator, whose head, tail, and legs are graphically rendered. The body, head, and tail are covered with nodes, each of which is encircled by a black ring and has a black dot upon the apex. Dotted rings and short strokes of black occupy the interspaces. These devices represent the spines

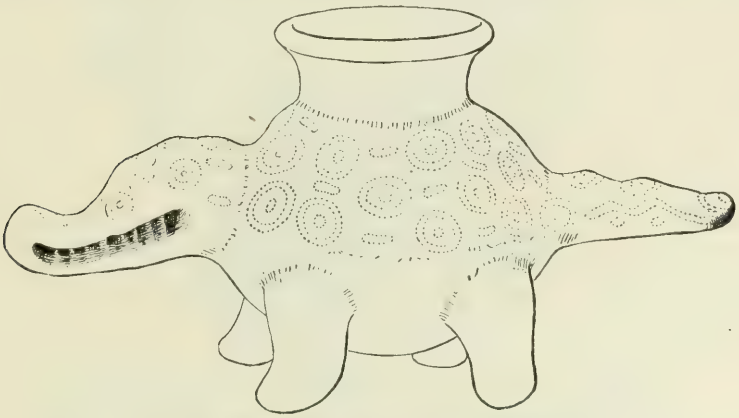


FIG. 199. Alligator vase, with conventional markings - ¼.

FIG. 200. Alligator vase, with conventional figures of the alligator painted on the sides — ¼.

and scales of the creature's skin. The legs are marked with horizontal stripes and oval spaces at the top inclose three dots each. The gen-

eral color of the vessel is a dark brown. This piece should be compared with the alligator whistle shown in Fig. 250.

A somewhat different treatment is shown in Fig. 200. Here the animal form has undergone considerable modification. There are but three legs—a concession to the conventional tripod—and the body exhibits, instead of the nodes and the markings of the creature's skin, two conventional drawings of the whole animal. Now, by higher and higher degrees of convention, we come to a long series of modified results which must be omitted for want of room. We find that the plastic features are gradually reduced until mere nodes appear where the head and the tail should be, and finally in the lower forms there remains but a blank panel or a painted device, as already shown in a preceding section. The painted devices are also reduced by degrees until all resemblance to nature is lost and geometric devices alone

FIG. 201. Vase having the head and tail of a serpent projecting from opposite sides of the body and connected by a meandered design which stands for the markings of the body—½.

remain. I observe in this association of plastic and painted features a lack of the perfect consistency I had learned to expect in the work of primitive peoples. It is easy to see how, from painting the markings of the creature's skin upon the body of the vessel, the painter should come gradually to delineate parts of the creature or even the whole creature, but we should not expect him to paint a creature distinct in kind from that modeled, thus confusing or entirely separating the conceptions; this has been done, apparently, in the vase illustrated in Fig. 202, where the plastic form represents a puma and the painting upon the sides seems intended for an alligator. It will be seen from the figures given that the devices of the panels or sides do not necessarily represent the markings of the animal's body, as in Fig. 201, but that they may refer to the entire creature (Fig. 200) or even to what appears to be a totally distinct creature (Fig. 202).

If realistic or semirealistic delineations are confused in this way it is to be expected that highly conventional derivative figures, so numerous and varied, should be much less clearly distinguished; that indeed there should be no certainty whatever in the reference to originals. It is difficult to say of any particular conventional device

that it originated in the figure of the animal as a whole rather than in some part or character of that animal or of some other animal.

A very instructive example bearing upon this subject is shown in Fig. 203. Attached to one side of the basin is a pendent head resem-

FIG. 202. Vase representing a puma, with figures of the alligator painted upon the sides — ½.

bling that of a serpent or a turtle. A kind of hood overhangs the head and extends in a ridge around the sides of the vessel, connect-

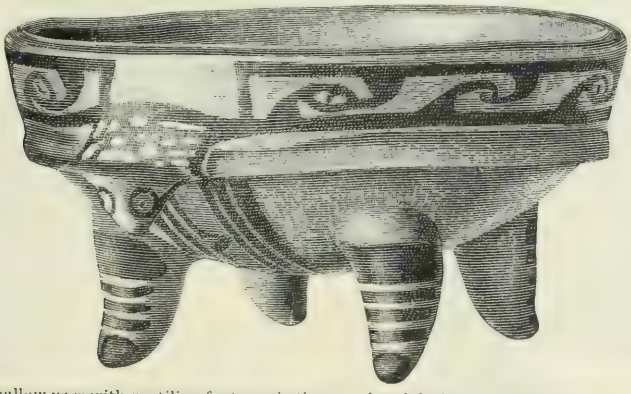


FIG. 203. Shallow vase with reptilian features in the round and designs in red and black representing the markings of the creature's body — ½.

ing with the tail of the creature, which is also pendent and hooded. Four legs support the vessel and are marked with transverse stripes of red and black paint. The upper surface of the head is covered with reticulated lines in black, and bands of conventional ornament in the same color extend around the sides of the vessel, uniting the head with the tail of the animal. A single band of ornament passes beneath the body, also connecting those members. It is plain that these painted bands serve to complete the representation of the reptile.

But, as I have just shown, they are as likely to stand for the whole creature or to be the abbreviated representative of the whole creature as to represent merely the markings of the body. These devices, as arranged in the zone, resemble in a remarkable degree the conventional running scroll.

I have but one more example of the alligator vases to present, but it is perhaps the most remarkable piece in the collection (Fig. 204).

FIG. 204. Vase with funnel shaped mouth and square body, supported by two grotesque figures and decorated with figures of alligators and monkeys—$\frac{1}{4}$.

It illustrates to good advantage both the skill and the strange fancy of these archaic potters. A large vase, having a high flaring rim and a subcubical body, is supported by two grotesque human appearing figures, whose backs are set against opposite ends of the vessel. The legs are placed wide apart, thus affording a firm support. The heads of the two figures project forward from the shoulder of the vase and are flattened in such a way as to give long oval outlines to the crowns

which are truncated and furnished with long slit-like openings that connect through the head with the main chamber of the vessel. The openings are about two and a half inches long and one-eighth of an inch wide and are surrounded by a shallow channel in the flat, well polished upper surface. The extraordinary conformation of this part of the vessel recalls the well known whistling vases of South America; but this piece is too badly broken to admit of experiment to test its powers. It is generally likened to a money box. In order to convey a clear conception of the shape of the upper surface, I present a top view of the vessel (Fig. 205).

A front view of one of the supporting figures is shown in Fig. 206. Although certainly not intended to represent a human figure with accuracy, it is furnished with a crown, as are the figures in gold and stone, and is covered with devices that seem to refer to costume. The features are extremely grotesque, the nose resembling the beak of a

FIG. 205. Top view of vase in Fig. 204, showing the main orifice and the oblong openings.

FIG. 206. End view of vase in Fig. 204, showing front view of grotesque figure. The red portions of the painted figures are outlined with dots.

bird and the mouth being a mere ridge, without indications of the lips. The face and the chest are painted with curious devices in red. The funnel and body of the vase are decorated with subjects that seem to have no connection with the plastic features and no relation to one another in subject matter. The upper panel, surrounded by a framework of black and red lines, contains the figure of an alligator much simplified and taking a peculiar position on account of the shape of the space into which it is crowded. The figure occupying the body panel is that of a very strangely conventionalized two tailed monkey and is enframed by a wide red line. On the shoulder of the vessel is an ornament consisting of a number of angular hooks attached to a straight line. The effect is like that of fretwork, but the figure is probably derived from a modified animal form. The paste of this

vase is sandy and is reddish gray near the surface and quite dark within the mass. The modeling is thoroughly well done, and the surface, which is of a somber, yellowish gray tint, is highly polished. The figures are drawn chiefly in black, red being confined to broad lines and areas. De Zeltner published photographic illustrations of a similar vase with his pamphlet on the graves of Chiriqui. That specimen is now, I believe, in the hands of Prof. O. C. Marsh, of New Haven. It corresponds very closely in nearly every respect with the example here described.

The polychrome group.—The National Museum collection contains but three examples of this most artistic of the wares of Chiriqui. Its claim to superiority rests upon a certain boldness and refinement of execution, combined with nobleness of outline and a type of design much in advance of other isthmian decoration. It is probably most nearly allied to the ware of the alligator group, and it possesses some of the characteristics of the best Central American work. Unlike

FIG. 207. Large vase with decorations in red and black – ⅛.

the other wares of Chiriqui, this pottery has a bright salmon red paste and the slip proper is a delicate shade of the same color. In nearly all cases undecorated portions of the surface are finished in

red, which appears to have been polished down as a slip. The designs are in three colors — black, a strong red, and a fine gray purple — which, in combination with the bright reddish ground, give a very rich effect. The first example, shown in Fig. 207, is a large, nearly symmetrical bottle with a short neck and a thick, flaring lip. The inner surface of the orifice and the lower half of the body are finished in red and the neck and shoulder in the salmon colored slip. A wide zone of ornament encircles the upper surface of the body. The designs are executed with great skill in red and black colors and include two highly conventional figures, probably of reptilian origin. The manner of their introduction into the zone is shown in Fig. 208. The

FIG. 208. Devices of the decorated zone of vase shown in Fig. 207.

oval faces are placed on opposite sides, taking the positions usually occupied by modeled heads. Each face is supplemented by a pair of arms which terminate in curiously conventional hands, and the two caudal appendages are placed midway between the faces, filling triangular areas. The body of the vase serves as a body for both creatures. In the illustration, the red of the design, which is carried over all of one face save the eyes and mouth and serves to emphasize the features of the other face, is indicated in vertical tint lines and the black is given in solid color. This vase is twelve inches in height.

A second example, illustrated in Fig. 209, is a fine piece of somewhat unusual shape. The orifice is trumpet shaped and rather too wide for good proportion. The body is flattened above and conical below and is supported by a rather meager annular foot. The paste

FIG. 209. Handsome vase with four handles and decorations in black, red, and purple — $\frac{1}{3}$.

is of a light brick red color, and the slip, as seen in the ground of the decorated belt, is a pale gray orange. Undecorated portions of the surface are painted red. The ornamented zone is interrupted by two pairs of handle-like appendages set upon the outer part of the shoulder. These projections may possibly have served as handles, as they are perforated both horizontally and vertically, but they are at the same time undoubtedly conventionalized animal forms, the creature being represented by the four flattened, transversely marked arms or rays and an eye-like device painted upon the top of each figure. The painted devices are seen in plan in Fig. 210, where the relations of the relieved features to the zone of painted decoration are clearly shown. This zone is divided into panels of unequal dimensions, and within these a number of extraordinary devices are drawn in three colors, red, black, and purple. These are distinguished in the plan by peculiar tint lines. The designs are of such a character as to leave little doubt that they are ideographic, although at present it is impossible to guess the nature of the associated ideas. The annular foot observed in this specimen illustrates the first step in the development of a feature the final stage of which is shown in Fig. 211. The latter

shape is such as would result from inverting the preceding form, removing the conical base of the body, and using the funnel shaped orifice as a stand. This highly developed shape implies a long prac-

FIG. 210. The painted designs of vase in Fig. 209 viewed from above.

tice of the art. The form is a usual one in Mexico and in Central America. The bowl is shallow and is set gracefully upon the stand, the whole shape closely resembling simple conditions of the classic kylix. The color of the paste is a pale brick red and that of the slip approaches orange. The walls are thick and even and the surface is very carefully polished.

The painted decoration is of unusual interest. The colors are so rich, the execution is so superior, and the conception so strange that we dwell upon it with surprise and wonder. The central portion of the bowl is occupied by what would seem to represent a fish painted in strong, firm, marvelously turned lines, and in a style of convention wholly unique. The outlines are in black and the spaces are filled in with red and purple or are left in the orange hue of the ground. An idea of the superior style of execution can be gained from Fig. 212. It will be impossible to characterize the details of the drawing in words. The strange position and shape of the head, the oddly placed eyes and mouth, and the totally incomprehensible treatment of the body can be appreciated, however, by referring to the illustration. A careful study leads inevitably to the conclusion that this

was no ordinary decoration, no playing with lines, but a serious working out of a conception every part of which had its significance or its raison d'être.

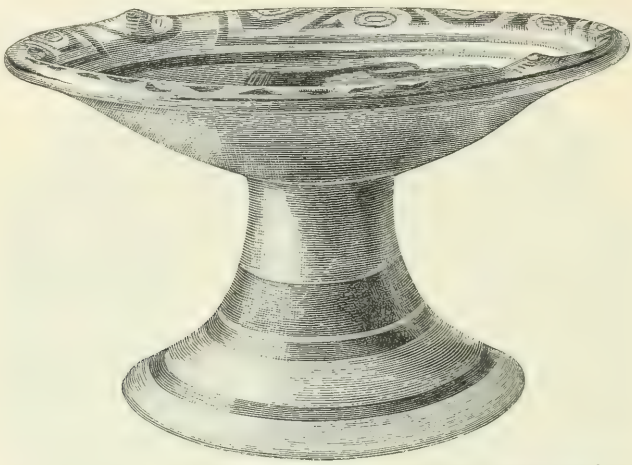


Fig. 211. Vase of unusual shape, with decoration in black, red, and purple. ⅓.

Fig. 212. Ornament occupying the interior surface of the basin of vase shown in Fig. 211.

The figures occupying the border zone of the bowl are worthy of careful inspection. It will be seen that the potter, even in this

highly specialized condition of the utensil, has not lost sight of the conception that the vessel is the body of an animal, as we have seen so often in simpler forms, and that the symbols of the creature should appear upon it and encircle it. The zone is divided into two equal sections by small knobs, painted, as are the handle-like appendages in the preceding specimen, to represent some animal feature. The lateral sections are occupied by eye-like figures that stand for the markings of the body of the creature symbolized. They really occupy the spaces left by a continuous waved body or life line, which they serve to define. Devices of this class are most frequently met with in connection with representations of the alligator. They may, however, symbolize the serpent, as occasionally seen in the alligator group. Decorative conceptions so remarkable as these could arise only through one channel: the channel of mythology. The superstitions of men have imposed upon the art a series of conceptions fixed in character and limited to especial positions, relations, and forms of expression. It is useless to speculate upon the nature of the mythologic conceptions with an idea of arriving at any understanding of the religion of the people; but we do learn something of the stage of development, something of the condition of philosophy.

I must not close this section without referring to some fine vases that belong apparently to this group and which were collected

FIG. 213. Large vase of fine shape and simple decorations. From De Zeltuer; about $\frac{1}{4}$.

by De Zeltner and illustrated by photographs accompanying his pamphlet. They are now, I believe, in the possession of Prof. O. C. Marsh. The sketches given herewith are copied from De Zeltner's photographs and are probably somewhat defective in details of drawing. The piece illustrated in Fig. 213 is not described by the author, but is evidently a handsome vessel and is decorated in a very simple manner. A band of devices symbolizing the body of an animal encircles the middle portion of the vase. The height is about a foot.

FIG. 214. Vase with extraordinary decorative designs. From De Zeltner — about ⅛.

A second piece (Fig. 214), of which two views are given by the same author, corresponds closely in many respects with the vase illustrated in Fig. 211 and is described in the following language:

My collection includes a cup (or chalice) of baked clay 25 centimeters in diameter, mounted on a hollow stand which gives it a height of 18 centimeters, and the designs of which are very rich and in perfect taste. The base is hollow and colored red, white, black, and purple; it has four narrow openings or slits, and the design represents plaits spirally arranged. The under side of the cup is divided into four compartments, each of which incloses a dragon painted in black and red on a white ground; the borders are sometimes red, sometimes purple. The body of the dragon might have been painted in China, so neat and intricate is the drawing.

The design upon the inside of the cup seems to resemble Egyptian art. The body of a man is seen, painted in red, the arms and legs separated, and the shoulders bearing the head of the dragon with teeth and crest. The color is similar to the rest of the piece — purple, white, and black. The intermediate spaces are filled with very intricate designs.

This extraordinary design is shown in Fig. 215, and it will be seen that it agrees in many respects with figures presented in the lost color and alligator groups. It is compound in character, however, the head referring to the alligator, the body and extremities perhaps to a man or to a monkey. The suggestion of the oriental dragon in this, as in other examples, is at once apparent, and the resemblance to certain conventional forms that come down to us from the earliest

known period of Chinese art is truly remarkable. We cannot, of course, predicate identity of origin even upon absolute identity of appearances, but such correspondences are worthy of note, as they may in time accumulate to such an extent that the belief in a common origin will force itself upon us.

FIG. 215. Painted design of vase in Fig. 214, viewed from above, thought to represent a dragon by De Zeltner; probably a composite of the alligator and the monkey or man.

Unclassified.—A small number of vases do not admit of classification under any of the preceding heads. In most cases, however, they are not of especial interest and may be passed over. They represent a number of varieties of ware and are possibly not all Chiriquian, their affinities being rather with the pottery of Costa Rica and Nicaragua. One remarkable piece, of which a sketch is given in Fig. 50, *c*, is of large size and is shaped somewhat like an hour glass, and on account of its peculiar form and markings may be said to resemble a corset. The upper end is somewhat the smaller, and the septum, which forms the bottom of the vessel, is placed about an inch above the base of the foot. The interior surface is smoothly polished and painted a dark dull red. The exterior is uncolored and neatly fluted. The series of vertical ribs of the upper end is sepa-

rated from those of the base by a belt of horizontal flutings, and a wide smooth space extends from the top to the base, the lower section of which is occupied by a row of button-like, indented knobs. The use of this utensil may not have been peculiar, but its shape is wholly unique. It resembles most nearly the ware of the maroon group. Its height is twelve inches.

Perhaps the most interesting of these unclassified vases is a somewhat fragmentary piece, of which an outline is given in Fig. 216. The ware closely resembles that of the alligator group in color of the

FIG. 216. Vase of unique form and decoration ½.

paste and slip, but the base has been supplied with an annular stand, a feature not observed in that group, and the colors of the design, with the exception of the black, are unlike those used in Chiriquian vases.

FIG. 217. Painted design of vase in Fig. 216 in black, red, and gray.

It will be seen by reference to Fig. 217 that the painted figures are partially pictorial, the conventional scenes including the sun, the moon, and stars. The more conventional parts of the design are very curious and without doubt are symbolic. The border of fret work is Mexican in style. The sun, which is only partially exposed above the horizon, is outlined in red and is surrounded by red rays. The

figures supposed to represent the moon and the stars are in black. In the illustration the reds of the original are represented by vertical tint lines and the brownish grays by horizontal tint lines. The black is in solid color.

MISCELLANEOUS OBJECTS OF CLAY.

As primitive peoples advance in culture and the various branches of art are differentiated, each of the materials employed is made to fill a wider and wider sphere of usefulness. Clay, applied at first to vessel making and used perhaps as an auxiliary in a number of arts in which it took no definite or individual shapes, gradually extended its dominion until almost every art was in a measure dependent upon it or in some way utilized it. The extent of this expansion of availability is in a general way a measure of the advancement of the races concerned. The Chiriquians employed clay in the construction of textile machinery, as shown by the occurrence of spindle whorls, and a number of small receptacles, probably needlecases, are constructed of that material. It was employed in the manufacture of stools, statuettes, drums, rattles, and whistles. With less cultured races, such as the Pueblo and mound builders of the north, such articles were rarely manufactured, while with the more cultured nations of Mexico and Peru a wider field was covered and the work was considerably superior.

SPINDLE WHORLS.

The art of weaving was carried to a high degree of perfection by many of the American races, but the processes employed were of the simplest kind. The threads were spun upon wooden spindles weighted

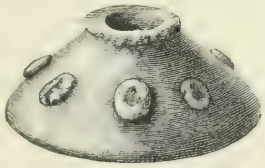


FIG. 218. Spindle whorl in gray clay decorated with annular nodes. ½.

FIG. 219. Spindle whorl of gray clay with animal figures.—½.

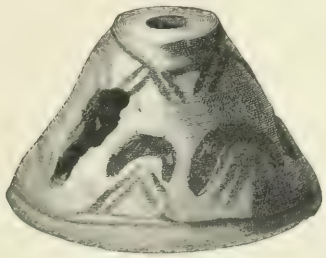


FIG. 220. Spindle whorl of dark clay with perforations and incised ornament.—½.

with whorls of baked clay. These whorls are not plentiful in the graves of Chiriqui, but such as have been collected are quite similar in style to those of Mexico and Peru. In Figs. 218, 219, and 220 we have three examples modeled with considerable attention to detail but comparatively rude in finish. They are in the natural color of the baked clay and are but rudely polished. The first is encircled by a line of rough, indented nodes, the second is embellished with homely little animal figures, and the third with incised patterns and rude incisions.

NEEDLECASES(?).

I have given this name to a rather large class of small oblong or oval receptacles that could have served to contain needles or any other small articles of domestic use or of the toilet. They consist of two parts, a vessel or body and a lid. The former takes a variety of cylindrical, subcylindrical, and doubly conical shapes, and the latter is conical and is in many cases furnished with a knob at the top for grasping with the fingers. The lid is attached or held in place by means of strings passed through small holes made for the purpose in corresponding margins of the two parts. These objects were in pretty general use in the province, as they are found to belong to a number of the groups of ware, being finished and decorated as are the ordinary vessels of these classes. A few type specimens are given in the following cuts. A fine example belonging to the unpainted ware is

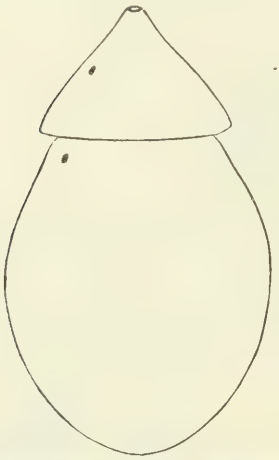


FIG. 221. Needlecase of unpainted clay with conical lid. ½.

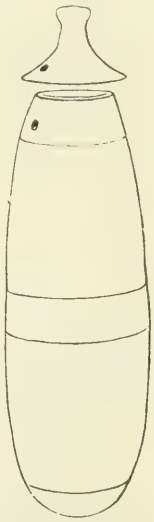


FIG. 222. Needlecase, lost color group of ware. ½.

shown in outline in Fig. 221. It is five inches in height and three in diameter and is pleasing in shape. The specimen outlined in Fig.

222 is of the lost color group, but has lost nearly all traces of the decorative design.

A fine example, with high polish and elaborate decoration, is presented in Fig. 223. The lid is raised to show the position of the perforations. Two interesting examples belonging to the dark incised

Fig. 223. Needlecase with painted geometric ornament, belonging to the lost color group of ware — ½.

Fig. 224. Needlecase of gray clay with angular incised geometric ornament — ½.

Fig. 225. Needlecase of gray clay with black polished surface and incised ornament — ½.

ware are shown in Figs. 224 and 225. The deeply incised design of the first is purely geometric, but is probably of graphic parentage, while that of the second, rather rudely scratched through the dark surface into the gray paste, is apparently a less highly conventionalized treatment of the same motive.

FIGURINES.

I have already called attention to the fact that there is no such thing in Chiriquian ceramic art as a well modeled human figure and apparently no indication of an attempt to render the human physiognomy with accuracy. It is highly probable that the personages embodied in the mythology of the people took the forms of animals or were anthropomorphic and gave rise to the peculiar conceptions embodied in their arts. The strange objects herewith presented are rendered in a measure intelligible by the adoption of this hypothesis. These figurines are confined to the alligator group of ware and are quite numerous. They are small, carefully finished, and painted with care in red and black lines and figures. They are semihuman and appear to be arrayed in costume. The head of each is triangular in shape, having a sharp, projecting profile, with the mouth set back beneath the chin, reminding one of the face of a squirrel or some such rodent.

The figures occupy a sitting posture. The legs are spread out horizontally, giving a firm support, and terminate in blunt cones, which are in some cases slightly bent up to represent feet. The hands rest upon the sides or thighs or clasp a small figure apparently intended for an infant, which, however, does not seem to have any human features. In one case this figure is placed upon the back of the figurine and appears to hold its place by means of four feet armed with claws (Fig. 226); in another it is held in front (Fig. 227). The neck is usually pierced to facilitate suspension, and the under side of the body—the sitting surface—is triply perforated, or punctured if solid, as if for the purpose of fixing the figure in an upright position to some

FIG. 226. Statuette, alligator group ½.

movable support. The central perforation is round and the lateral ones, on the under side of the legs, are oblong. The largest specimen is six inches in height and the smallest about one and a half inches. They are rather elaborately painted with black and red devices which, by their peculiar geometric character, are undoubtedly intended to indicate the costume. The hair is represented by black stripes, which descend upon the neck, and the face is striped with red. They are found associated with other relics in the graves and were possibly only toys, but more probably were tutelary images or

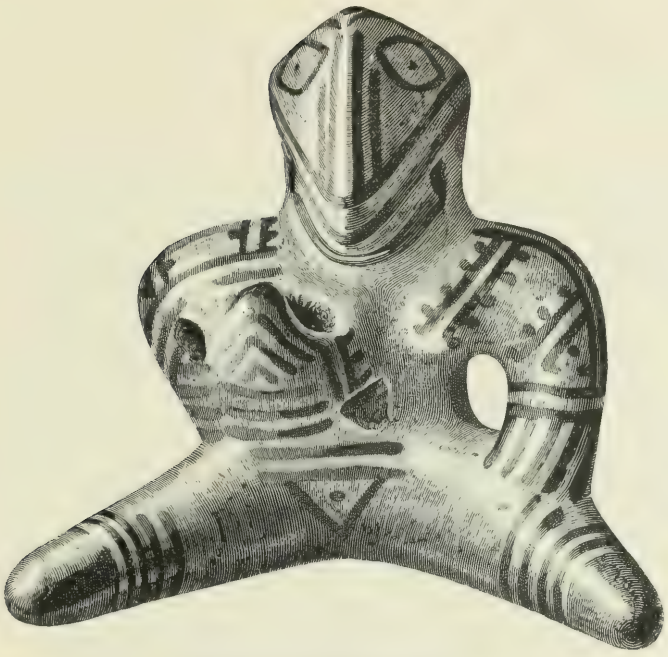


FIG. 227. Statuette, alligator group ½.

served some unknown religious purpose. The sex is usually feminine. Two additional examples showing side and back views are outlined in Figs. 228 and 229.

FIG. 228. Statuette of small size ½.

FIG. 229. Statuette of largest size ½.

STOOLS.

I have given this name to a class of stone carvings presented in a previous section, and, for want of a better name, give it also to a series of similar objects modeled in clay. These are among the most elaborate products of Chiriquian art. In all cases they are of the yellowish unpainted pottery and indicate much freedom and skill in the handling of clay. They do not show any well defined evidences of use, and as they are too slight and fragile to be used as ordinary seats we are left to surmise that they may have served some purpose in the religious rites of the ancient races. They are uniform in construction and general conformation and consist of a circular tablet supported by upright circular walls or by figures which rest upon a strong, ring shaped base. The tablet or plate is somewhat concave above, is less than an inch in thickness, and has a diameter of ten and one-fourth inches in the largest piece, descending to seven and one-half in the smallest. The margin is rounded and usually embellished with a beaded ornament consisting of grotesque heads, generally reptilian. The variations exhibited in details of modeling are well shown by the illustrations. In the example given in Fig. 230

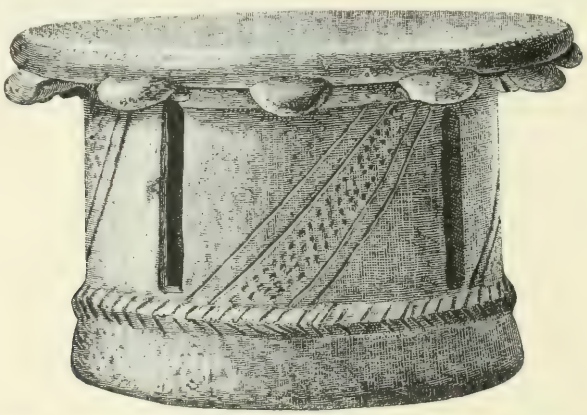


FIG. 230. Stool of plain terra cotta, decorated with grotesque heads and incised figures—¼.

the upright portion is a hollow cylinder, having four vertical slits, alternating with which are oblique bands of ornament in incised lines and punctures. The projecting margin of the tablet is encircled by a row of grotesque, monkey-like heads, facing downward.

Fig. 231 illustrates a specimen in which three grotesque figures, with forbidding faces, alternate with as many flat columns embellished with rude figures of alligators. Eighteen grotesque, monkey-like heads occupy the lower margin of the seat plate in the spaces between the heads of the supporting figures. This specimen illustrates the favorite Chiriquian method of construction. The various parts were modeled separately in a rough way and then set into place

in the order of their importance. When this was done and the insertions were neatly worked together with the fingers, a number of small instruments were employed in finishing: a sharp stylus for indicating parts of the costume, and blunt points and small tubular dies

FIG. 231. Stool of plain clay, with grotesque figures — ¼.

for adding intaglio details of anatomy, such as the navel, the pupils of the eyes, and the partings of the fingers and toes.

The discoidal plate of another specimen is supported by four absurdly grotesque monkeys, giving a general effect much like that of the last.

A very remarkable piece is shown in Fig. 232 The tablet is sup-

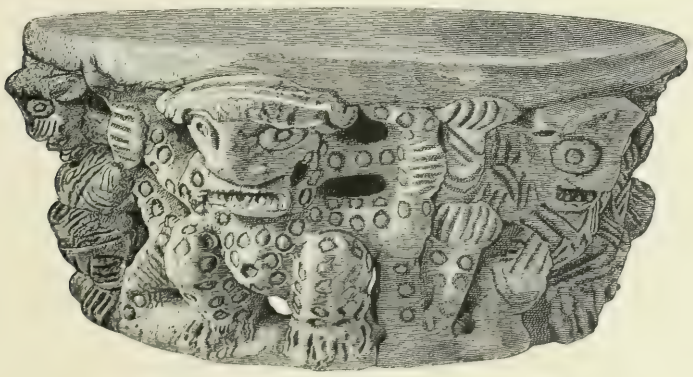


FIG. 232. Stool of plain terra cotta, with strange figures ¼.

ported by six grotesque figures, somewhat human in appearance, whose limbs are intertwined with serpents, suggesting the famous group of the Laocoön. The work is roughly done and the details

are not carried out in a very consistent manner, as the arms and legs of the figures become confused with the reptiles and are as likely to terminate in a snake's head as in a hand or foot. The rudely shaped bodies are covered with indented circlets or with short incised lines. The material, color, and finish are as usual. The height is four and one-half inches and the diameter of the tablet ten inches.

There are additional specimens in the National Museum. In one case, the largest specimen of the series, the tablet is supported by five upright female human figures and the margin is encircled by a cornice of forty-six neatly modeled reptilian heads. A small example differs considerably in general shape from those illustrated, the base being much smaller than the circular tablet. The supporting figures are two rudely modeled ocelots and two monkey-like figures, all of which are placed in an inverted position. Similar objects are obtained from the neighboring states of Central and South America.

MUSICAL INSTRUMENTS.

Something is already known of the musical instruments of the ancient Chiriquians through fugitive specimens that have found their way into collections in all parts of Europe and America. The testimony of the earthen relics—for no others are preserved to us—goes to show that the art of music was, in its rude way, very assiduously practiced, and that it probably constituted with these, as with most primitive communities, a serious and important feature in the various ceremonial exercises. Clay is naturally limited to the production of a small percentage of the musical instruments of any people, the various forms of woody growths being better adapted to their manufacture. We have examples of both instruments of percussion and wind instruments, the former class embracing drums and rattles and the latter whistles and clarionette-like pipes.

Rattles.—Besides the ordinary rattles attached to and forming parts of vessels, as already described, there are a number of small pieces that seem to have served exclusively as rattles, while some are rattle and whistle combined in one piece. In no case, however, would they seem to the unscientific observer to be more than mere toys, as they are of small size and the sounds emitted are too weak to be perceptible at any considerable distance. At the same time it is true that they may have had ceremonial offices of no little consequence to the primitive priesthood. The simple rattles are shaped like gourds, the body being globular and the neck or handle long and straight. Like the wares already described, they are finished and decorated, the majority belonging to the lost color group. The length varies from three to six or seven inches. A number of minute slit-like orifices or perforations for the emission of the sound occur about the upper part of the body (Fig. 233). A septum is placed in the lower part of the neck, so that the handle, which is hollow and open at the

upper end, may serve as a whistle. In some cases the lower part of the neck is perforated for suspension at the point occupied by the septum, as imperfectly shown in the section (Fig. 234). The most interesting specimen in the collection is shown in Fig. 235; it is especially notable on account of its construction, which points clearly to the gourd as a prototype. The body is of the usual globular shape, slightly elongated above. The neck is represented as a separate piece

FIG. 233. Rattle decorated in the style of the lost color group — ½.

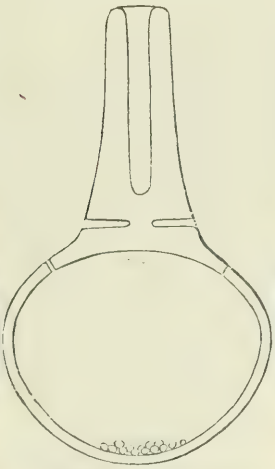


FIG. 234. Section of rattle shown in Fig. 233.

FIG. 235. Rattle of plain ware surmounted by two grotesque figures — ½.

lashed on with cords by means of perforations made for the purpose, just as are the handles of similar instruments constructed of gourds and reeds in Central American countries. The compartments of the handle and of the body are separate and the sound produced by the small oval pellets is emitted through slits of the usual form. The top of the handle is surmounted by a pair of grotesque human figures, male and female, placed back to back and united at the backs of the heads as seen in the cut. This object is gray in color and presents the roughened granular surface resulting from long exposure to the elements.

Drums.—The drum was a favorite instrument with the native American musician. Early explorers found its use next to universal, and the "tambour" is even now a characteristic feature of the musical paraphernalia of the Spanish-Americans. The primitive instrument was made by stretching a thin sheet of animal tissue over the orifice of a large gourd vessel or a vessel of wood or clay. The

use of clay was probably exceptional, as there are but three specimens in our Chiriquian collection. The shape is somewhat like that of an hour glass, the upper part, however, being considerably larger than the base or stand. In all cases the principal rim is finished with especial reference to the attachment of the vibrating head. The example presented in Fig. 236 has a deeply scarified belt an inch wide encircling the rim, and below it is a narrow ridge, intended perhaps to facilitate the lashing or cementing on of the head. Two raised bands, intended to imitate twisted cords, encircle the most constricted part of the body, a single band similarly marked encircling the base. The surface is gray in color and but rudely polished. The walls are about three-eighths of an inch thick, the height sixteen and one-half inches, and the greatest diameter seven and one-half inches.

FIG. 236. Drum of gray unpainted clay. ¼.

The decorated specimen illustrated in Fig. 237 is imperfect, a few inches of the base having been lost. The shape is rather more elegant than that of the other specimen and the surface is neatly finished and polished. The ground color or slip is a warm yellow gray and the decoration is in red and black. The rim or upper margin is

rather rudely finished and is painted red and on the exterior is made slightly concave and furnished with a raised band to facilitate the attachment of the head. The painted ornament encircles the body in four zones, two upon the upper portion and two upon the base.

FIG. 237. Drum with painted ornament in the style of the lost color group—⅓.

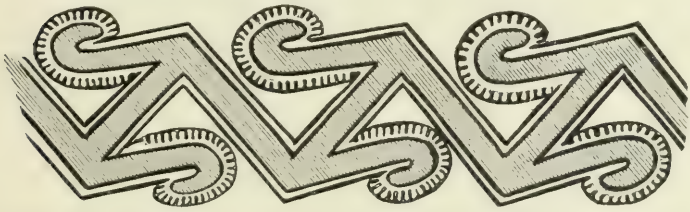


FIG. 238. Conventional design on drum shown in Fig. 237, composed of alligator derivatives.

The designs occupying the body zones are unique and viewed in the light of their probable origin are extremely interesting. In another place further on in this paper I shall show that they are probably

very highly conventionalized derivatives of the alligator radical, the meandered line representing the body of the creature and the scalloped hooks the extremities (Fig. 238). The two bands upon the base consist of geometric figures, the origin of which cannot be definitely determined, although they also probably refer to the alligator.

In the collection there is a minute toy drum of the same general shape, and the same form reappears in some of the whistles, in one of which (Fig. 247) the skin head and its fastenings are all carefully reproduced in miniature. The immediate original of this particular form of drum was probably made of wood. A drum recently brought from Costa Rica was made by hollowing out a cylindrical piece of wood and stretching a piece of snakeskin across the top. The shape is nearly identical with that of these earthen specimens.

Wind instruments.—Earthenware wind instruments are found in considerable numbers and are associated with other relics in the tombs. Nearly all are very simple in construction and are limited in musical power, receiving and perhaps generally deserving no better name than whistles or toys. A few pieces are more pretentious and yield a number of notes, and if operated by skilled performers or properly concerted are capable of producing pleasing melodies. It is not difficult to determine the powers of individual instruments, but we cannot say to what extent these powers were understood by the original owners, nor can we say whether or not they were intended to be played in unison in such a way as to give a certain desired succession of intervals. There are, however, in a large number of these instruments a uniformity in construction and a certain close correspondence in the number and degree of the sounds that indicate the existence of well established standards. It does not appear absolutely certain to me that the system of intervals was made to conform to that of any known scale; but a difficulty arises in attempting to determine this point, as most of the pieces are more or less mutilated. We find also that the note producible by any given stop is not fixed in pitch, but varies, with the force of the breath, two or even three full intervals. As a result of this a glide is possible to the skilled performer from note to note and any desired pitch can be taken.

In material, finish, and decoration these objects do not differ from the ordinary pottery. A majority belong to the alligator group. The size is generally small, the largest specimen being about eight inches in length. The shapes are wonderfully varied and indicate a lively imagination on the part of the potter. Animal forms prevail very decidedly, that of the bird being a great favorite. In many cases the animals copied can be identified, but in others they cannot—perhaps from our lack of knowledge of the fauna of the province, perhaps from carelessness on the part of the artist or from the tendency to model grotesque and complicated shapes. The following creatures can be recognized: men, pumas, ocelots, armadillos, eagles, owls, ducks, parrots,

several varieties of small birds, alligators, crabs, and scorpions. Vegetal forms, excepting where in use as instruments or utensils, as reeds and gourds, were not copied. In the National Museum collection there are two tubular pipes, probably modeled after reeds, and another resembles a gourd in shape. The construction of the whistling apparatus is identical in all cases and corresponds to that of our flageolets (see sections, Figs. 240 and 242). Plain tubes were doubtless also used as whistles, and all utensils of small size, such as needlecases and toy vases, can be made to give forth a note more or less shrill, according to the size of the chamber. The simplest form of whistle produces two shrill notes identical in pitch. The shape is

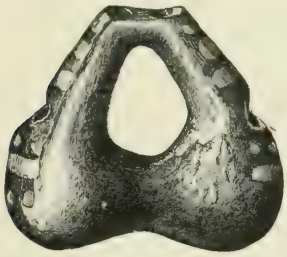


FIG. 239. Double whistle, lost color ware — $\frac{1}{1}$.

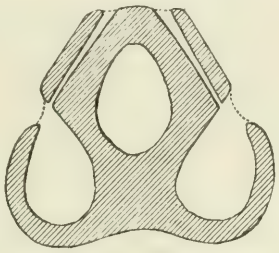


FIG. 240. Section of double whistle.

double, suggesting a primitive condition of the tibiæ pares of the Romans. The parts are pear or gourd shaped, are joined above and below, and have an opening between the necks. The two mouthpieces are so close together that both are necessarily blown at once. The note produced is pitched very high and is extremely penetrating,

not to say ear splitting, making an excellent call for the jungles and forests of the tropics. A small specimen is presented full size in Fig. 239, and the section in Fig. 240 shows the relative positions of the mouthpieces, air passages, vent holes, and chambers.

Reed shaped instruments are furnished with passages and orifices corresponding to the other forms. The chamber is tubular and the lower end is open, and the finger holes, when present, are on the upper side of the cylinder. One example without finger holes has two notes nearly an octave apart, which are produced, the higher with the tube open and the lower with it closed. Perhaps the most satisfactory instrument in the whole collection, so far as range is concerned, is shown in Fig. 241, and a section is given in Fig. 242. It is capable of yielding the notes indicated in the accompanying scale: First, a normal series of eight sounds, produced as shown in the diagram, and,

second, a series produced by blowing with greater force, one note two octaves above its radical and the others three octaves above. These

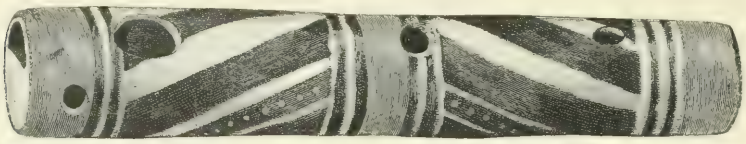


FIG. 241. Tubular instrument with two finger holes, alligator group $\frac{1}{4}$.

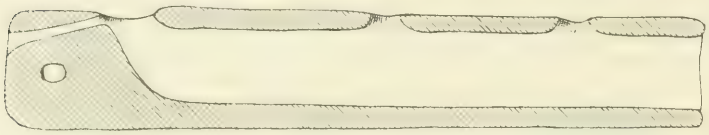
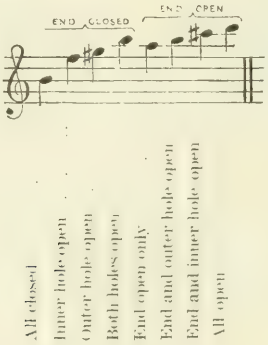


FIG. 242. Section of whistle.

notes are difficult to produce and hold and were probably not utilized by the native performer.



Two little instruments of remarkable form and unusual powers stand quite alone among their fellows. One only is entire. It is made of dark clay and represents a creature not referable to any known form, so completely is it conventionalized. A fair idea of its appearance can be gained from Figs. 243 and 244. The first gives the

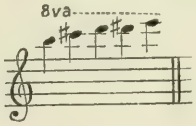
FIG. 243.

FIG. 244.

Small animal shaped whistle of blackish ware, with four finger holes — $\frac{1}{4}$.

side view and the second the top view. The mouthpiece is in what appears to be the forehead of the creature. The vent hole is beneath

the neck and there are four minute finger holes, one in the middle of each of four flattish nodes, which have the appearance of large protruding eyes. A suspension hole passes through a node upon the top of the head. The capacity of this instrument is five notes, clear in tone and high in pitch. It is notable that the pitch of each stop, when open alone, is identical, the holes being of exactly the same size.



In playing it does not matter in what order the fingers are moved. The lower note is made with all the holes closed and the ascending scale is produced by opening successively one, two, three, and four holes. The fragmentary piece is much smaller and the holes are extremely small.

Of a distinct type of form, although involving no new principle of construction, are two top-like or turnip shaped instruments, one of which is shown in Fig. 245. The form is symmetrical, the ornamentation tasteful, and the surface highly polished. The ware is of the alligator group and is decorated in red and black figures. A section is given in Fig. 246, *a*, and top and bottom views in *b* and *c*. By reference to these a clear conception of the object can be formed.

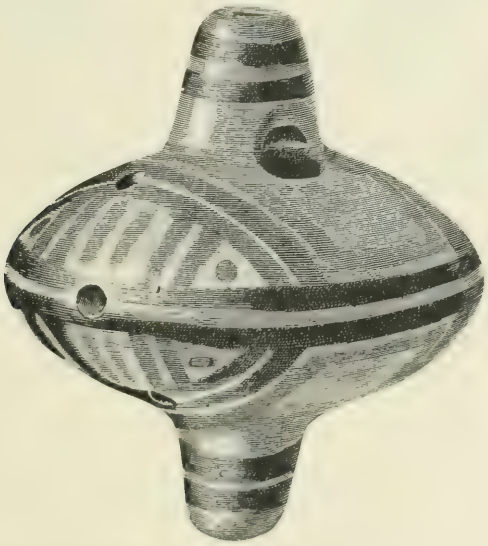


FIG. 245. Top shaped instrument, with three finger holes, alligator ware. ¼

The companion piece is identical in size, shape, and conformation, and, strange to say, in musical notes also. The tones are not fixed,

as each can be made to vary two or three degrees by changing the force of the breath. The tones produced by a breath of average force are

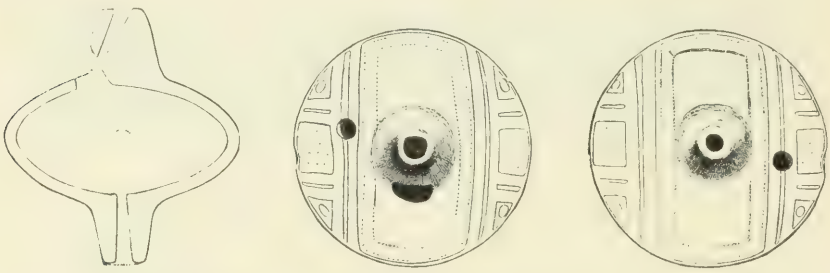
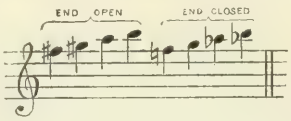


Fig. 246. Section and vertical views of instrument shown in Fig. 245.

indicated as nearly as may be in the accompanying scale. They will be found to occur nearer the lower than the upper limit of their

ranges. It should be observed that the capacity for variation possessed by each of these notes enables the skilled performer to glide from one to the other without interruption. This instrument is, therefore, within its limited range, as capable of adjusting itself to any succession of intervals as is the trombone or the violin. I do not imagine, however, that the aboriginal performer made any systematic use of this power or that the instrument was purposely so constructed. It will be seen by reference to the scale that stopping the orifice in the end opposite the mouthpiece changes the notes half a tone, or perhaps, if accurately measured, a little less than that.

Our collection contains several dozen three note whistles or pipes. Most of these represent animal forms, which are treated in a more or less realistic way, but with a decided tendency toward the grotesque. Nearly all are of small size, the largest, an alligator form, having a length of about eight inches. In the animal figures the air chamber is within the body, but does not conform closely to the exterior shape. The mouthpieces and the orifices are variously placed, to suit the fancy of the modeler, but the construction and the powers are pretty uniform throughout. There are two finger holes, placed in some cases at equal and in others at unequal distances from the mouthpiece, but they are always of equal size and produce identical notes. The capacity is therefore three notes. The lower is produced when all the orifices are open, the higher when all are closed, and the middle when one hole—no matter which—is closed.

Besides the animal forms there are a number of shapes copied from other musical instruments or from objects of art, such as vases. A very interesting specimen, illustrated in Fig. 247, modeled in imita-

tion of a drum, has not only the general shape of that instrument, but the skin head, with its bands and cords of attachment, is truthfully represented. A curious conceit is here observed in the association of the bird—a favorite form for the whistles—with the drum. A small figure of a bird extends transversely across the body of the drum chamber, the back being turned from the observer in the cut. The tail serves for a mouthpiece, while the finger holes are placed in

FIG. 247. Drum shaped whistle of plain ware, with bird figure attached. ½.

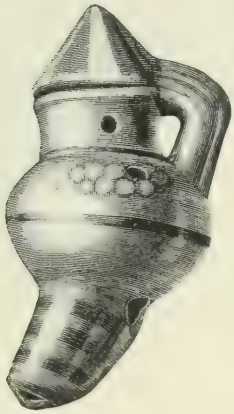
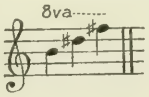
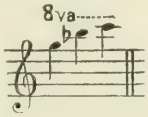


FIG. 248. Vase shaped whistle, lost color ware.—½.

the breast of the bird, the position usually assigned to them in simple bird whistles: its three notes are indicated in the accompanying scale:



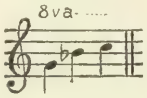
One specimen is vase or pitcher shaped, with base prolonged for a mouthpiece and with a neat handle (Fig. 248). The ground color is a dull red, upon which are traces of painted figures. Its notes are as follows:



A novel conceit is exhibited in the crab shaped instrument presented in Fig. 249, which gives a back view of the animal. On the opposite side are four small conical legs, upon which the object rests as does a vase upon its tripod. The mouthpiece is in the right arm, beneath which is the sound hole. The two finger holes are in the

FIG. 249. Crab shaped whistle, alligator ware. ½.

back behind the eyes of the creature and a suspension hole is seen in the left arm. The painted designs are in red and black lines upon a yellowish gray ground. The following scale indicates its capacity:



The largest specimen in the collection, shown in Fig. 250, represents an alligator and is finished in the usual conventional style of the alligator group. The air chamber is large and the sounds emitted

FIG. 250. Alligator shaped whistle, alligator ware. ¼.

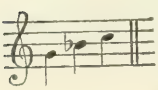
are full and melodious and are lower in pitch than those of any other instrument in the collection. The cavity in the mouth and head is separated from the body chamber, and, with the addition of earthern pellets, probably served as a rattle. The mouthpiece is in the tail and the finger holes are in the sides of the body.

Mammals are very often reproduced in these instruments. What appears to be the ocelot or jaguar is the favorite subject. A representative specimen is shown in Fig. 251. The mouthpiece is in the tail and one of the sound holes is in the left shoulder and the other beneath the body. The head is turned to one side and the face is decidedly cat-like in expression.

Fig. 251. Cat shaped whistle, alligator ware ½.

The decoration is in black and red and may be taken as a typical example of the conventional treatment of the markings of the bodies of such animals. The tips of the ears, feet, and tail are red. Rows of red strokes, alternating with black, extend in a broad stripe from the point of the nose to the base of the neck. Red panels, inclosing rows of red dots and enframed by black lines, cross the back. On the sides we have oblong spaces filled in with the conventional devices so common in other animal representations. The legs are striped and dotted after the usual manner.

A unique form, and one that will be looked at with interest by comparative ethnologists on account of the treatment of the tongues, is given in Fig. 252. The instrument consists of an oblong body to which four ocelot heads are fixed, one at each end and the others at the sides. It rests upon four feet, in one of which the mouthpiece is placed. The finger holes are in the side of the body near the legs, as seen in the cut. The decoration which consists of more or less con-

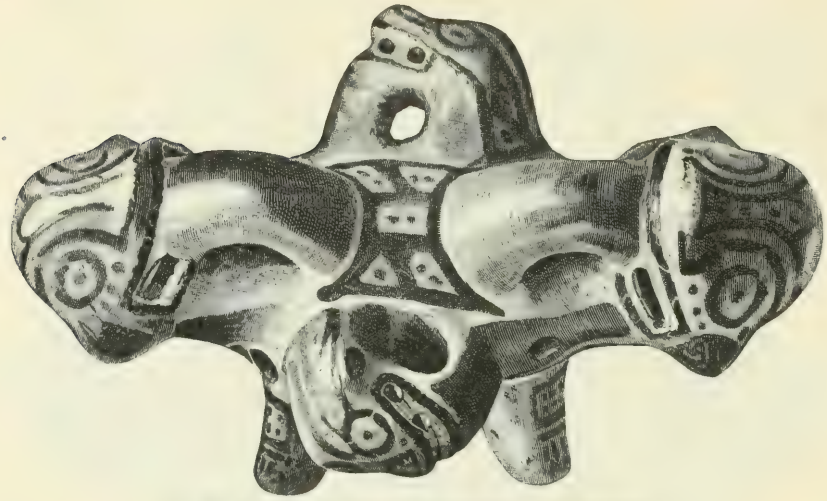
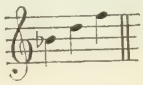


FIG. 252. Whistle with four ocelot-like heads, alligator ware. ⅓.

ventional representations of the skin markings of the animal, is in black and red. Its notes are three, as follows:



The prevalence of bird forms is due no doubt to the resemblance of the notes of primitive whistles to the notes of birds. The shape of the bird is also exceptionally convenient, as the body accommodates the air chamber, the tail serves as a mouthpiece, and the head is convenient for the attachment of a cord of suspension. A great variety of forms were modeled and range from the minute proportions of the smallest humming bird to those of a robin. The larger pieces represent birds of prey, such as hawks, eagles, and vultures, and the smaller are intended for parrots and song birds. The treatment is always highly conventional, yet in many cases the characteristic features of the species are forcibly presented. The painted devices have reference in most cases to the markings of the plumage, yet they partake of the geometric character of the designs used in ordinary vase painting. The ground is the usual yellowish gray of the slip, and nearly all the pieces belong to the lost color and alligator groups.

A characteristic example is illustrated in Fig. 253. The head is large and flat and the painted devices are in the red and black of the lost color group. The three notes are as follows:

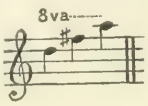
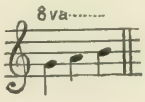


FIG. 253. Bird shaped whistle, with decoration in black, lost color ware — ½.

The piece given in Fig. 254 has the shape and markings of a hawk or eagle. It belongs to the alligator ware and is elaborately finished

FIG. 254. Bird shaped whistle, with conventional decoration in red and black, alligator ware — ½.



in semigeometric devices in red and black. All of these devices refer more or less definitely to the markings of the plumage.

The example shown in Fig. 255 represents a bird with two heads, the shape and markings of which suggest one of the smaller song birds.

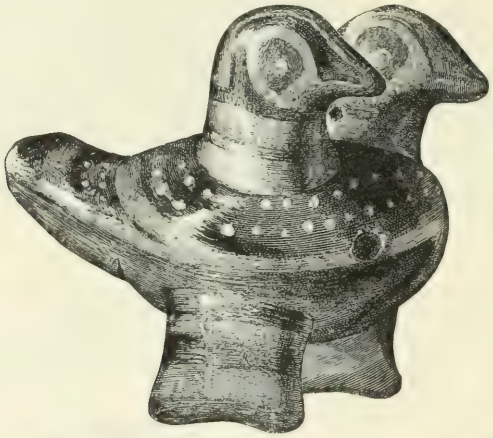
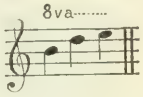


FIG. 255. Two headed, bird shaped whistle, with conventional decoration in black, lost color ware – ½



I cannot say that the whistles were modeled and pitched with the idea of imitating the notes of particular birds, but it is possible for the practiced performer to reproduce the simpler songs and cries of birds with a good deal of accuracy.

The human figure was occasionally utilized. The treatment, however, is extremely rude and conventional, the features having the

*FIG. 256. Whistle in grotesque life form, with decorations in black and red, alligator ware – ½.

peculiar squirrel-like character shown in the figurines already given. The unique piece given in Fig. 256 represents a short, clumsy female figure with a squirrel face, carrying a vessel upon her back by means of a head strap, which is held in place by the hands. The mouthpiece of the whistle is in the right elbow and one sound hole is in the middle of the breast and the other in the left side. The costume and some of the details of anatomy are indicated by red and black lines in the original. Its notes are the same as those presented with Fig. 249.

LIFE FORMS IN VASE PAINTING.

This section is to be devoted to a short study of the decorative system of the ancient Chiriquians, and more especially to a consideration of the treatment of life forms in vase painting. Many of the finest examples of these designs, so far as execution and effect in embellishment are concerned, have already been given; but it is desirable now to select and arrange a series to illustrate origins and processes of growth or modification.

Elements of ornament flow into the ceramic art from a number of sources, but chiefly in two great currents: the one from art, and consisting chiefly of technical or mechanically produced phenomena, and hence geometric, and the other from nature, and carrying elements primarily delineative, and hence non-geometric. When once within the realm of decoration the various motives or elements are subject to modification by two classes of influences or conditioning forces: the technical restraints of the art and the esthetic forces of the human mind. Mechanical and geometric elements, although born within the art or its associated arts, are modified in the processes of adaptation to the changing requirements and conditions of the art and through the tendency towards elaboration under the guidance of the esthetic forces; left by themselves they remain, throughout all changes of use and modification of form, purely geometric. Imitative elements tend, under the same influences, to move in the direction of the unreal or geometric. In this way the realistic forms undergo marked changes, gradually assuming a geometric character and finally losing all semblance of nature.

Now it must be noted that the decorations of any group of art products may embody both classes of elements or they may be restricted rather closely to either. This fact enables us to account for many of the strongly marked distinctions observed in the decorative systems of different communities, races, and times. In a recent study of ancient Pueblo art I traced the decoration to a mechanical origin, mainly in the art of basketry, and thus accounted for its highly geometric character. Chiriquian art presents a strong contrast to this, as the great body of elements are manifestly derived from nature by delineative imitation. It was further observed in Pueblo art that as

time went on life forms were little by little introduced into its decoration and that in recent times they shared the honors equally with the primitive geometric forms. In Chiriquian art we find but meager traces of a primitive geometric system, and conclude that either the earliest art of the people did not give rise to such a system or that the graphic motives, entering gradually and steadily multiplying, supplanted the archaic forms, finally usurping nearly the entire field. As noticed in the preceding sections, there is always a certain amount of geometricity in the arrangement and the enframing of the designs, as well as a certain degree of convention in the treatment of even the most graphic motives; but these characters may be due to the restraining conditions of the art, rather than to the survival of original or ancestral features or characters.

In beginning the study of Chiriquian decorative art I found it impossible to approach the subject advantageously from the geometric side, as was done in the Pueblo study, since life elements so thoroughly permeate every part of it. I have, therefore, turned about, and in the following study present first the more realistic delineations of nature, arranging long series of derivative shapes which descend through increasing degrees of convention to purely geometric forms. These remarks relate wholly to the plan or linear arrangement of the motives.

As to method of realization, ceramic ornament may be arranged in two classes: the plastic or relieved and the non-plastic or flat. Life forms are freely rendered by both plastic and non-plastic methods, and in either style may range from the highly realistic to the purely geometric. As shown in a preceding section, plastic life forms in Chiriquian art appear to have been subject to two divergent lines of thought, the one trivial and the other serious. Through the one we have grotesque and perhaps even humorous representations of men and of animals. The figures are attached to the vessels for the purpose—perhaps for the exclusive purpose—of embellishment, and often with excellent success, as judged by our own standards of taste. The other deals with plastic representations apparently of a serious nature, although utilized also for embellishment. The animal forms employed are treated in a way to suggest that in the mind of the artist the creature bore a definite relation to the vessel or its use, a relationship originating in superstition and preserved throughout all changes of form. Their office was symbolic, and this office was probably not always lost sight of by the potter, even though, through the forces of convention, the animal shapes were reduced to mere knobs, ridges, or even to painted devices.

In color delineations, although the same subjects are to a great extent employed, there is necessarily greater constraint—there is less freedom as well as less vigor in the presentation of natural forms. There is apparently no attempt at the grotesque or amusing. The

variants are practically infinite. The work is more purely decorative and is perhaps less subject to the restraints of associated ideas and of use with particular vessels or in definite relations to other features of the vessel. At the same time it is manifest that these painted figures are not all merely meaningless decorations, but that many, throughout all degrees of modification, refer with greater or less clearness to natural originals, to ideas associated with these originals, or to the relationship of these originals to the vessel and its uses.

It is clear, however, that a considerable body of nature-derived elements, plastic and painted, are employed as simple embellishments, having no other function. This suggests the separation of all decorations into two grand divisions, based upon the kind of thoughts associated with them. These divisions may be designated as significant and non-significant, the term significant referring not to the mere identification of a device with an original form or to its office as an ornament, but to its symbolism, to its mystic relation with the vessel and its uses. But I have to do here with the forms taken by motives, with their morphology rather than with their signification, as the latter must, with reference to archæologic material, remain greatly speculative.

In the application of life forms in vase painting several classes of modifying and constraining agencies of a technical nature are present, and the following examples are grouped with the idea of defining these classes of forces and keeping them in a measure distinct.

Of all the animal forms utilized by the Chiriquians the alligator is the best suited to the purpose of this study, as it is presented most frequently and in the most varied forms. In Figs. 257 and 258 I re-

FIG. 257. Graphic delineation of the alligator, from a vase of the lost color group.

FIG. 258. Graphic delineation of the alligator, from a vase of the lost color group

produce drawings from the outer surface of a tripod bowl of the lost color group. Simple and formal as these figures are, the character-

istic features of the creature—the sinuous body, the strong jaws, the upturned snout, the feet, and the scales—are forcibly expressed. It is not to be assumed that these examples represent the best delineative skill of the Chiriquian artist. The native painter must have executed very much superior work upon the more usual delineating surfaces, such as bark and skins. The examples here shown have already experienced decided changes through the constraints of the ceramic art, but are the most graphic delineations preserved to us. They are free hand products, executed by mere decorators, perhaps by women, who were servile copyists of the forms employed by those skilled in sacred art.

FIG. 259. Conventional alligator, from the lost color ware.

A third illustration from the same group of ware, given in Fig. 259, shows, in some respects, a higher degree of convention. The scales are here represented by triangular dentals, which occupy the entire

FIG. 260. Style of convention in the alligator group of ware.

FIG. 261. Style of convention in the alligator group of ware.

length of the back. These dentals are filled with the round dots that stand singly in the preceding cases.

In another class of ware — the alligator group — the treatment is quite different, being decidedly more clumsy and realized by distinct processes ; but prominence is given to a number of corresponding features. The strong curve of the back, the dentals and dots, and the muzzle and mouth refer apparently to the same creature. The curiously marked panel in the body of the last example is a unique feature, which appears, however, in a few other cases.

These drawings occur upon the sides of vases, alternating with the plastic features, and are perhaps generally associated with such features in the expression of some mythical idea.

The modeled creature is often represented with two heads instead of with a head and a tail, and the painted forms, in many cases, exhibit the same peculiarity as shown in Fig. 262. I surmise that the employment of two heads arises from the need of securing perfect balance of parts rather than as an original product of the imagination.

It will be interesting, as additional examples are presented, to note the effect of modification upon particular features of the animal, to observe how some come into prominence, representing the creature and the idea, while others fall into disuse and disappear. In nature the line of the body is perhaps the most strongly characteristic feature,

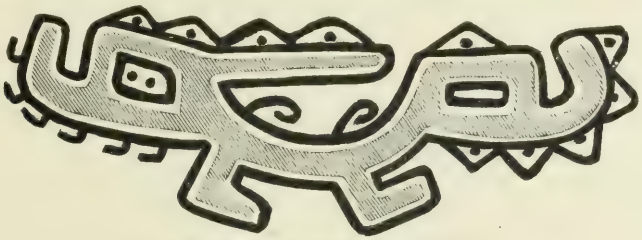


Fig. 262. Two headed form of the alligator.

and it is in art the most persistent. It survives in the stems of many conventional devices from which all other suggestions of the animal have vanished.

The following examples depart still further from nature, approaching the border line between the distinctly imitative and the purely conventional or geometric phases. In the first (Fig. 263) all the leading features are recognizable, but are very much simplified. The

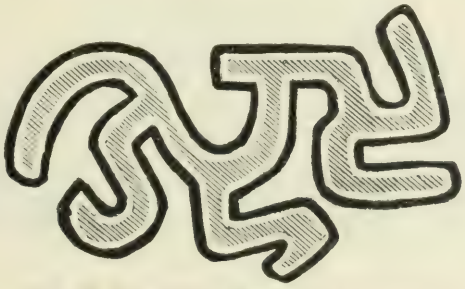


Fig. 263. Figure of the alligator much simplified.

jaws are without teeth, the head is without eyes, and the body without indication of scales. The other example (Fig. 264) is of a somewhat different type and may possibly refer to some other reptilian form.

FIG. 264. The alligator much modified by ceramic influences.

but many links connecting the two are found. The shape is more angular and is a step further removed from nature. From shapes as conventional as this we drop readily into purely geometric forms, as will be seen further on. These and the preceding drawings are all executed on broad surfaces, where fancy could have free play. The modifying or conventionalizing forces are, therefore, quite vague. Variation from natural forms is due partly to a lack of skill on the part of the painter, partly to the peculiar demands of ceramic embellishment, and partly to the traditional style of treatment acquired in still more primitive stages of culture and in other and unidentified branches of art.

I shall now call attention to some important individualized or well defined agencies of convention. First, and most potent, may be mentioned the enforced limits of the spaces to be decorated, which spaces take shape independently of the subject to be inserted. When the figures must occupy a narrow zone they are elongated, when they must occupy a square they are restricted longitudinally, and when they must occupy a circle they are of necessity coiled up. Fig. 265

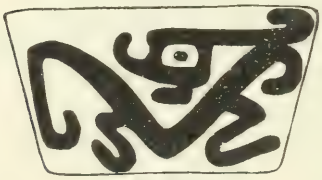


FIG. 265.

FIG. 266.

FIG. 267.
Illustrations of the influence of the shape of spaces upon the delineation of animal forms.

illustrates the effect produced by crowding the oblong figure into a short rectangular space. The head is turned back over the body and the tail is thrown down along the side of the space. In Fig. 266 the figure occupies a circle, and is in consequence closely coiled up, giving the effect of a serpent rather than an alligator. In Fig. 267 the space is semicircular, and we observe peculiar conventional condi-

FIG. 268. Delineation retaining but slight traces of the life form.

tions, some of which may be due to other causes. For example, such spaces may originally have been filled with purely geometric figures, which tended to impart their own characters to the life forms that supplanted them.

FIG. 269. Delineation retaining but slight traces of the life form.

Now, it often happens that, as in the last example given, the animal form, literally rendered, does not fill the panels satisfactorily. The head and the tail do not correspond and there is a lack of balance. In such cases two heads have been preferred. The body is given a uniform double curve and the heads are turned down, as shown in Figs. 268 and 269, or one may turn up and the other down, as seen in Fig. 270. The two headed form may also arise from imi-

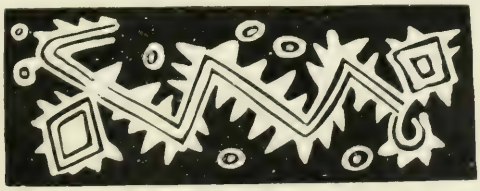


FIG. 270. Delineation retaining but slight traces of the life form.

tation of plastic forms, as I have already shown. The example given

in Fig. 268 is extremely interesting on account of its complexity and the novel treatment of the various features. The two feet are placed close together near the middle of the curved body, and on either side of these are the under jaws turned back and armed with dental projections for teeth. The characteristic scale symbols occur at intervals along the back; and very curiously at one place, where there is scant room, simple dots are employed, showing the identity of these two characters. Some curious auxiliary devices, the origin of which is obscure, are used to fill in marginal spaces. The shape given in Fig. 269 is so highly modified that it is not recognizable as an animal form, excepting through a series of links connecting it with more realistic delineations. It is perfectly symmetrical and consists of a compound curve for the body, with hooks at the extremities and two appended hooks for legs. The spots symbolizing the scales are here placed within the body, showing another step toward complete annihilation of the natural forms and relations. Three additional examples, showing still higher degrees of convention, are presented in Figs. 271, 272, and 273. The series could be filled up and continued indefinitely,

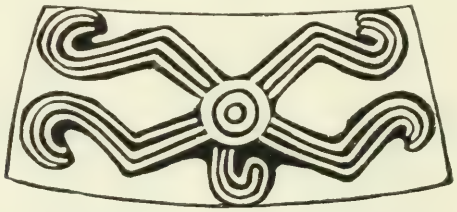


FIG. 271. Highly conventionalized alligator derivative.

FIG. 272. Highly conventionalized alligator derivative.

FIG. 273. Highly conventionalized alligator derivative.

connecting the whole family of devices in which dentals, hooks, spots, and circles occur with the alligator radical or with other reptilian forms confused with the alligator through the carelessness or ignorance of the decorator.

In looking over a large series of the vases it will be seen that the tendency of decoration is toward the zonal arrangement, the spaces

being narrow and long, even when divided into the usual number of panels. As a consequence the motives tend to take linear forms. Parts are repeated or greatly drawn out to fill the spaces. This phase of conventional evolution may be illustrated by a multitude of examples.

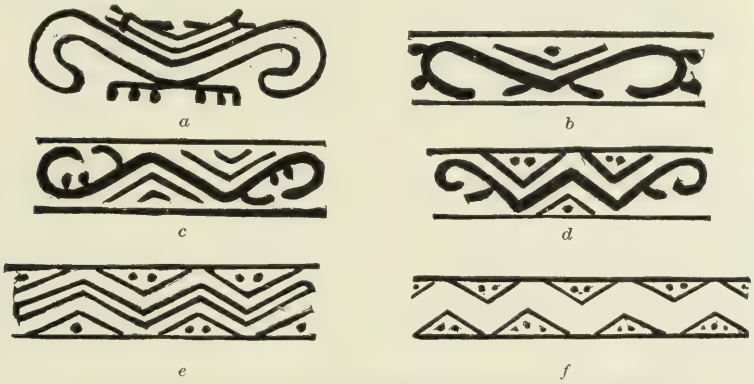


FIG. 274. Series of forms showing modification through use in narrow zones.

Beginning with an ordinary form in Fig. 274, *a*, we advance under the restraint of parallel border lines through the series, ending in a simple meander, *f*, the spaces about which are, however, filled out with the conventional scale symbols, the triangles inclosing dots. Thus we witness the transformation of the life form into a linear device, in which the flexures of the body are emphasized and multiplied without reference to nature, and there is little doubt that the series continues further, ending with simple curved lines and even with straight lines unaccompanied by auxiliary devices.

Next to the body line the most important of the alligator derivatives is the notched or dotted hook, which in the lost color group stands sometimes for the whole creature, but more frequently for one or more of the members of its body, the snout, the tail, or the feet. It is employed singly or in various arrangements suited to

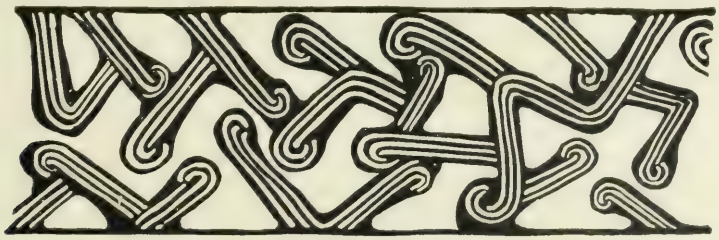


FIG. 275. Running ornaments composed of life elements.

the shape of the spaces to be filled or occurs in connection with the body line or stem, where, by systematic repetition, it serves to fill the triangular interspaces. Take, for example, an ornament (Fig. 275) which encircles the shoulder of a handsome vase of the

lost color group. The space is neatly filled with groupings in which the simple life coil elements are joined one to another in

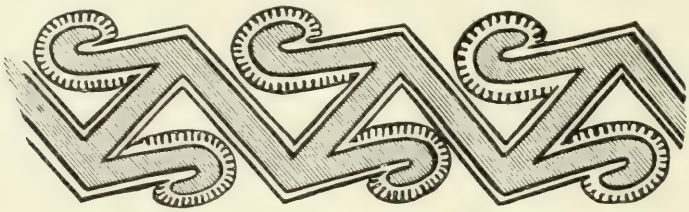
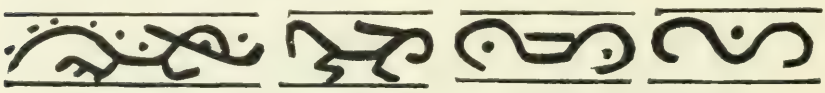


FIG. 276. Running ornaments composed of life motives.

such a way as to give somewhat the effect of an ordinary running ornament. The same motive takes a different form in Fig. 276, which is part of the decorated zone of an earthen drum (see Fig. 235). Here the body of the creature is represented by a wide meandered line, and to this the notched or scalloped hooks are attached with perfect regularity, one to each angle of the meandered body. In other examples the angular geometric character extends to every part of the detail and the curved hooks lose their last suggestion of nature and are entirely dropped or used separately.

The rings, strokes, spots, and dentate figures that serve to represent the markings and scales of the reptile are among the most important of the derivative devices and occur in varied relations to other classes of derivatives. They also occur independently, either singly or in groupings. Thus we see that the alligator, in Chiriquian vase painting, is represented by an endless list of devices, and it is interesting to note that among these are several figures familiar to the civilized world in both symbolism and ornament.

I present five series of figures designed to illustrate the stages through which life forms pass in descending from the realistic to highly specialized conventional shapes. In the first series (Fig. 277), we begin with a meager but graphic sketch of the alligator; the



a *b* *c* *d*

FIG. 277. Series of derivatives of the alligator showing stages of simplification.

second figure is hardly less characteristic, but is much simplified; in the third we have still three leading features of the creature: the body line, the spots, and the stroke at the back of the head; and in the fourth nothing remains but a compound, yoke-like curve, standing for the body of the creature, and a single dot.

The figures of the second series (Fig. 278) are nearly all painted upon low round nodes placed about the body of the alligator vases and hence are inclosed in circles (see Fig. 197). The animal figure

in the first example is coiled up like a serpent, but still preserves some of the well known characters of the alligator. In the second example we have a double hook near the center of the space which takes the place of the body, but the dotted triangles are placed separately against the encircling line. In he next figure the body symbol is omitted and the three triangles remain to represent the animal. In the fourth there are four triangles, and the body device, being restored in red, takes the form of a cross. In the

FIG. 278. Series showing stages in the simplification of animal characters.

fifth two of the inclosing triangles are omitted and the idea is preserved by the simple dots. In the sixth the dots are placed within the bars of the cross, the triangles becoming mere interspaces; and in the seventh the dots form a line between the two encircling lines. This series could be filled up by other examples, thus showing by what infinitesimal steps the transformations take place. The round nodes upon which these medallion-like figures are drawn are survivals of the heads or other parts of animals originally modeled in the round, but in the processes of manufacture partially or wholly atrophied. It was sought to preserve the idea of the creature by the use of painted details, but these, as we have seen, were also in time reduced to formal marks, symbols doubtless in many cases of the conception to which the original plastic form referred.

The derivation of the fret and scroll — most admired of the decorative motives of numerous races — has been a fruitful source of discussion. The vase painting of Chiriqui serves to throw new light upon the subject. We learn by the series of steps illustrated in the annexed cuts that the alligator radical, under peculiar restraints and influences, assumes conventional forms that merge imperceptibly into these classic devices. In the third series given (Fig. 279) the first figure is far removed from the realistic stage of representation, but it is one of the ordinary conventional guises of the alligator. Other still more conventional forms are seen in the three succeeding figures, the last of which is a typical rectangular fret link known and used by most nations of moderate culture. The derivatives in nearly all

the preceding figures can be traced back to the body of the creature as a root, but there are many examples which seem to have come from the delineation of a part of the creature, as the head, foot, eye, or

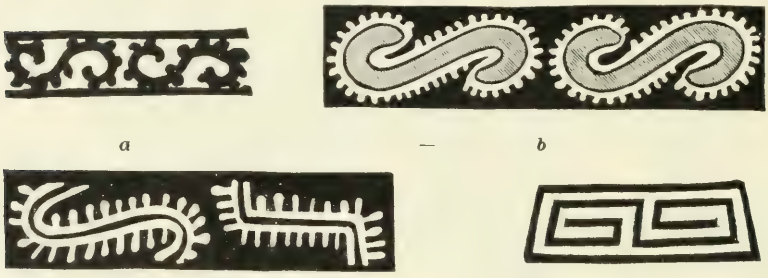


Fig. 279. The scroll and fret derived from the body line of the alligator.

scales—abbreviated representatives of the whole creature. Such parts, assuming the rôle of radicals, pass also through a series of modifications, ending in purely geometric devices in the manner indicated in the following or fourth series of examples (Fig. 280). In the first cut we have what appears to be the leg and foot of the favorite reptile, and following this are other forms that seem to refer to the

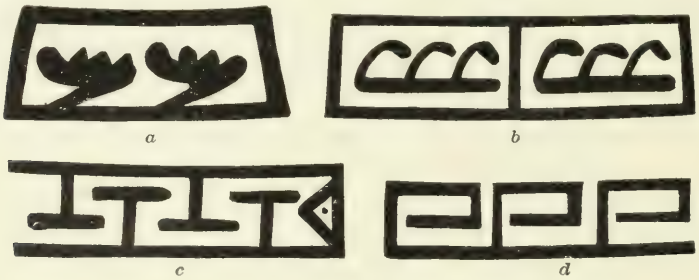


Fig. 280. Devices derived from drawings of parts of the life form.

same feature. Additional examples are shown in Figs. 281 and 282, which, while they doubtless arose more or less directly from the life form, are not so readily traceable through less conventional antecedents. The first forms part of the incised ornament of a small vase or needlecase and the second is a section of the zonal ornament of the tripod cup illustrated in Fig. 203, by reference to which it will be

Fig. 281. Devices incised in a needlecase.

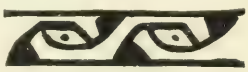


Fig. 282. Devices representing the markings of a reptile's body.

seen that the zone of devices serves to connect the head and the tail of the reptile, which are modeled as a part of the vase; the devices

therefore represent the markings of the creature's body, although they may originally have been derived from the figure of the whole or a part of the animal rather than from the markings of the skin. In other examples still more highly conventional figures are found to hold the same relation to the plastic representation of the extremities of the creature. They include the meander, the scroll, the fret, and the guilloche. We find that in the stone metates of many parts of Central America, nearly all of which are carved to imitate the puma, the head and tail of the creature are connected by bands of similar devices that encircle the margin of the mealing plate (see Fig. 9). The alligator form is therefore not necessarily the originator of all such devices. It is probable that any animal form extensively used by such lovers of decoration as the ancient inhabitants of Central America would be found thus interwoven with decoration. These considerations will serve to widen our views upon the origin and development of especial devices. As it now stands we are absolutely certain that no race, no art, no motive or element in nature or in art can claim the exclusive origination of any one of the well known or standard conventional devices, and that any race, art, or individual motive is capable of giving rise to any and to all such devices. Nothing can be more absurd than to suppose that the signification or symbolism attaching to a given form is uniform the world over, as the ideas associated with each must vary with the channels through which they were developed.

Other classes of geometric figures, derived chiefly from scale or skin markings, are given in the fifth series. In more realistic phases of rep-

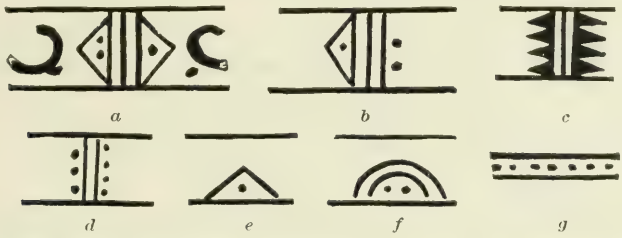


FIG. 283. Conventional figures derived from the markings of the bodies of animals.

resentation the dentate and dotted devices are ranged along the body of the creature, as in nature, but as convention progresses they are used independently to fill up spaces, to form the septa of panels, &c. Many illustrations appear in the preceding pages and additional examples are given in Fig. 283. It is possible that these devices come from delineations of a number of distinct animal forms; but in the higher stages of convention confusion cannot be avoided, and must have existed to some extent in the mind of the decorator; they serve, however, to illustrate the stages of simplification through which all forms extensively used for a long period must pass. The laws of derivation, modification, and application in art are the same in all.

It has now been shown that life forms and their varied derivatives constitute the great body of Chiriquian decorative motives; that when first introduced the delineations are more or less realistic, according to the skill of the artist or the demands of the art; but that in time, by a long series of abbreviations and alterations, they descend to simple geometric forms in which all visible connection with the originals is lost. The agencies through which this result is accomplished are chiefly the mechanical restraints of the art acting independently of voluntary modification and without direct exercise of esthetic desire.

There may be forces at work of which we find no clear indications. Some of the conventional forms into which life forms are found to grade may be survivals of forms originating in other regions and belonging to other cultures which have through accidents of contact imposed themselves upon Chiriquian art; such are the scroll, the fret, and the guilloche; but the thorough manner in which such forms are interwoven with purely Chiriquian conceptions makes it impossible to substantiate such a theory. The conclusion most easily and most naturally reached is that all are probably indigenous to Chiriqui, and hence the striking deduction that *the processes of modification inherent in the art are of such a nature that any animal form extensively used in decoration may give rise to any or all of the highly conventional forms of ornament.*

During the progress of this study a question has frequently been raised as to the extent to which the memory of the creature original or of its symbolism in first use was kept alive in the mind of the decorator. It is a well established fact that primitive peoples habitually invest inanimate objects with the attributes of living creatures. Thus the vessel, from the time it assumes individual shape and is fitted to perform a function, is thought of as a living being, and by the addition of plastic or painted details it becomes a particular creature, an alligator, a fish, or a puma, each of which is in most cases the symbol of some mythologic concept. When, through the changes of convention in infinite repetition, all resemblance to individual creatures was lost and mere knobs or simple geometric figures occupied the surface of the vessel, there is little doubt that many of these features still recalled to the mind of the potter the ultimate originals and the conceptions of which they were the representatives, and that others represented ideas, the outgrowth of or a development from primary ideas, while still others had acquired entirely new ideas from without. It cannot be denied, however, that there does come a time in the history of vase painting at which such associated ideas become vague and are lost and elements formerly significant are added and combinations of them are made for embellishment alone, without reference to meaning or appropriateness; but I am inclined to place this period a very long way from the initiatory stages of the art. It

may not be possible to find evidence of the arrival of this period, as it is not necessarily marked by any loss of unity or consistency—striking characteristics of ancient American art; for such is the conservatism of indigenous methods that, unless there be forcible intrusion of exotic art, original forms and groupings may be perpetuated indefinitely and remain much the same in appearance after the associated ideas are modified or lost.

In our study of the forms and meanings of these devices it should not be forgotten that collateral branches of art are also simultaneously employing the same motives and reducing them through other similar classes of conventionalizing forces to corresponding forms. Recording arts—pictography, hieroglyphic and phonetic writing—carry life forms through all degrees of abbreviation and change, and all ceremonial and all domestic arts with which such forms are associated do the same; and it is not impossible that many conventional forms found upon pottery are borrowed outright from the other arts. It will be impossible to detect these borrowed elements unless very literally transferred from some art the style of which is well known. It would be comparatively easy to identify literal borrowings from phonetic art or even from hieroglyphic art, as the form and arrangement of the devices are quite unlike those observed in pure decoration. We do not know that Chiriquian culture had achieved a hieroglyphic or a phonetic system of writing, but it is worth while to call attention to the form and the manner of employment of some of the de-

FIG. 284. Vase with decorated zone containing remarkable devices—$\frac{1}{3}$.

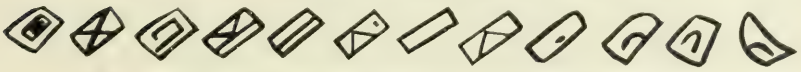


FIG. 285. Series of twelve conventional devices from the decorated zone of a vase.

vices found upon the pottery. In Fig. 284 I present an outline drawing of a vase, the shoulder of which is encircled by a broad zone of decoration. This zone is divided into panels by oblique lines. A row of rectangular compartments extends along the middle of the band and rows of triangular spaces occur at the sides. Each space is

occupied by a device having one or more features suggesting a pictorial original and doubtless derived from one. In the main row there are twelve figures, no two of which are identical. Although we are unable to show that any of these characters had other than a purely decorative use, we see how richly the ancient peoples were supplied, through the conventionalizing agencies of the art, with devices that could have been employed as ideograms and letters where such were needed, and devices, too, that, from their derivation and use in the art, must in most cases have had ideas associated with them.

RÉSUMÉ.

A brief summary of the more salient points of interest dwelt upon in this paper may very appropriately be given in this place. We find that a limited area—a small and obscure province of the isthmian region—possesses a wonderful wealth of art products the character of which indicates a long period of occupation by peoples of considerable culture. The art remains are perhaps as a whole inferior to those of the districts to the north and south, but they possess many features in common with the art of neighboring provinces. There is, however, at the same time, a well marked individuality. In conception and execution these works are purely aboriginal, and, so far as can be determined by the data at hand, are pre-Columbian, and possibly to a great extent remotely pre-Columbian. The discovery of articles of bronze, which metal we cannot prove to be of indigenous production, is the only internal evidence pointing toward the continuance of the ancient epoch of culture into post-Columbian times. The relics are obtained from tombs from which nearly all traces of human remains have disappeared.

Art in stone covers the ground usually occupied by works in this material in other Central American countries, save in the matter of architecture, of which art there are but meager traces. There are rock inscriptions, statuettes and statues of rather rude character, shapely mealing stones, elaborately carved seats or stools, many celts of extremely neat workmanship, spear and arrow points of unique shape, and a very few beads and pendent ornaments. There are apparently no traces of implements of war.

In metal there are numerous and somewhat remarkable works. They are of gold, gold-copper alloy, copper, and bronze. The objects are of small size, rarely reaching a pound in weight, and they are almost exclusively pendent ornaments. They were, for the most part, cast in molds, and in nine cases out of ten represent animal forms. A few bells are found, all of which are of bronze. Pieces formed of alloyed metal are usually washed or plated with pure gold.

The great body of relics are in clay, and the workmanship displayed is often admirable. Vases are found in great numbers, and

as a rule are small and shapely, and are so carefully and elaborately decorated as to lead to the inference that their office was in a great measure ceremonial. They take a high place among American fictile products for grace of form and beauty of decoration. There is neither glaze nor evidence of the use of a wheel. Besides vases we have several other classes of objects, which include grotesque, toy-like statuettes, small, covered receptacles resembling needlecases, seat-like objects elaborately modeled, spindle whorls, and musical instruments. The occurrence of numerous specimens of the two latter classes indicates that the arts of weaving and music were assiduously practiced.

An examination of the esthetic features of the ceramic art has proved exceptionally instructive. We find much that is worthy of attention in the forms of vases as well as in the plastic or relieved features of embellishment, and a still richer field is opened by the study of the incised and painted — the flat — decorations.

I have shown that the elements of decoration flow into the ceramic art chiefly through two channels, the one from art and the other from nature. Elements from art are mainly of mechanical origin, and are, therefore, non-imitative and geometric. Elements from nature imitate natural forms, and hence are primarily non-geometric. Elements from art, being mechanical, are meaningless or non-ideographic; those from nature are in early stages of art usually associated with mythologic conceptions, and hence are ideographic. All decorations may therefore have four dual classifications, as follows: First, with reference to method of realization, as plastic and flat; second, with reference to derivation, as mechanical and imitative; third, with reference to plan of manifestation, as geometric and non-geometric; and, fourth, with reference to the association of ideas, as significant and non-significant.

I have found that the ceramic art, having acquired the various elements of ornament, carries them by methods of its own through many strange mutations of form. The effect upon life forms is of paramount importance, as is indicated by the following broad and striking generalization: The agencies of modification inherent in the art in its practice are such that any particular animal form extensively employed in decoration is capable of changing into or giving rise to any or to all of the highly conventional decorative devices upon which our leading ornaments, such as the meander, the scroll, the fret, the chevron, and the guilloche, are based. It is further seen, however, that ideographic elements are not necessarily restricted to decorative or symbolic functions, for the processes of simplification reduce them to forms well suited to employment in hieroglyphic and even in phonetic systems of expression. Such systems are probably made up to a great extent of characters the conformation of which is due to the unthinking — the mechanical — agencies of the various arts.

A STUDY OF THE TEXTILE ART

IN ITS RELATION TO THE

DEVELOPMENT OF FORM AND ORNAMENT

BY

WILLIAM H. HOLMES.

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TEXTILE ART IN ITS RELATION TO THE DEVELOPMENT OF FORM AND ORNAMENT.

By William H. Holmes.

INTRODUCTION.

The textile art is one of the most ancient known, dating back to the very inception of culture. In primitive times it occupied a wide field, embracing the stems of numerous branches of industry now expressed in other materials or relegated to distinct systems of construction. Accompanying the gradual narrowing of its sphere there was a steady development with the general increase of intelligence and skill, so that with the cultured nations of to-day it takes an important, though unobtrusive, place in the hierarchy of the arts.

Woven fabrics include all those products of art in which the elements or parts employed in construction are largely filamental and are combined by methods conditioned chiefly by their flexibility. The processes employed are known by such terms as interlacing, plaiting, netting, weaving, sewing, and embroidering.

The materials used at first are chiefly filiform vegetal growths, such as twigs, leaves, roots, and grasses, but later on filiform and then fibrous elements from all the kingdoms of nature, as well as numerous artificial preparations, are freely used. These are employed in the single, doubled, doubled and twisted, and plaited conditions, and are combined by the hands alone, by the hands assisted by simple devices, by hand looms, and finally in civilization by machine looms.

The products are, first, individual structures or articles, such as shelters, baskets, nets, and garments, or integral parts of these; and, second, "piece" goods, such as are not adapted to use until they are cut and fitted. In earlier stages of art we have to deal almost exclusively with the former class, as the tailor and the house furnisher are evolved with civilization.

In their bearing upon art these products are to be studied chiefly with reference to three grand divisions of phenomena, the first of which I shall denominate *constructive*, the second *functional*, and the third *esthetic*. The last class, with which this paper has almost exclusively to deal, is composed mainly of what may be called the superconstructive and superfunctional features of the art and includes three subdivisions of phenomena, connected respectively with (1) form, (2) color, and (3) design. Esthetic features of form are,

in origin and manifestation, related to both function and construction; color and design, to construction mainly. In the following study separate sections are given to each of these topics.

It is fortunate perhaps that in this work I am restricted to the products of rather primitive stages of culture, as I have thus to deal with a limited number of uses, simple processes, and simple shapes. In the advanced stages of art we encounter complex phenomena, processes, and conditions, the accumulation of ages, through which no broad light can fall upon the field of vision.

In America there is a vast body of primitive, indigenous art having no parallel in the world. Uncontaminated by contact with the complex conditions of civilized art, it offers the best possible facilities for the study of the fundamental principles of esthetic development.

The laws of evolution correspond closely in all art, and, if once rightly interpreted in the incipient stage of a single, homogeneous culture, are traceable with comparative ease through all the succeeding stages of civilization.

FORM IN TEXTILE ART.

Form in the textile art, as in all other useful arts, is fundamentally, although not exclusively, the resultant or expression of function, but at the same time it is further than in other shaping arts from expressing the whole of function. Such is the pliability of a large portion of textile products — as, for example, nets, garments, and hangings — that the shapes assumed are variable, and, therefore, when not distended or for some purpose folded or draped, the articles are without esthetic value or interest. The more rigid objects, in common with the individuals of other useful arts, while their shape still accords with their functional office, exhibit attributes of form generally recognized as pleasing to the mind, which are expressed by the terms grace, elegance, symmetry, and the like. Such attributes are not separable from functional attributes, but originate and exist conjointly with them.

In addition to these features of form we observe others of a more decidedly superfunctional character, added manifestly for the purpose of enhancing the appearance.

In very primitive times when a utensil is produced functional ideas predominate, and there is, perhaps, so far as its artificial characters are concerned, a minimum of comeliness. But as the ages pass by essential features are refined and elements of beauty are added and emphasized. In riper culture the growing pressure of esthetic desire leads to the addition of many superficial modifications whose chief office is to please the fancy. In periods of deadened sensibility or even through the incompetence of individual artists in any period, such features may be ill chosen and erroneously

applied, interfering with construction and use, and thus violating well founded and generally accepted canons of taste. In respect to primitive works we may distinguish four steps in the acquisition of esthetic features of form, three of which are normal, the fourth abnormal: First, we have that in which functional characters alone are considered, any element of beauty, whether due to the artist's hand or to the accidents of material, construction, or model, being purely adventitious; second, that in which the necessary features of the utensil appear to have experienced the supervision of taste, edges being rounded, curves refined, and symmetry perfected; third, that in which the functionally perfect object, just described, undergoes further variations of contour, adding to variety, unity, &c., thus enhancing beauty without interfering with serviceability; and, fourth, that in which, under abnormal influences, beauty is sought at the sacrifice of functional and constructive perfection.

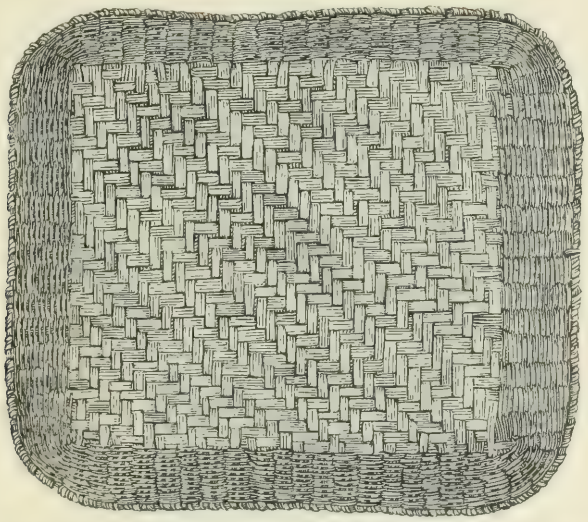

FIG. 286. Mat or tray exhibiting a minimum of esthetic attributes of form. Moki work—½.

The exact relations of the various classes of forces and phenomena pertaining to this theme may be more fully elucidated by the aid of illustrations. Woven mats, in early use by many tribes of men and originating in the attempt to combine leaves, vines, and branches for purposes of comfort, are flat because of function, the degree of flatness depending upon the size of filaments and mode of combination; and in outline they are irregular, square, round, or oval, as a result of many causes and influences, embracing use, construction, material, models, &c. A close approach to symmetry, where not imposed by some of the above mentioned agencies, is probably due to esthetic tendencies on the part of the artist. The esthetic interest attaching to such a shape cannot be great, unless perhaps it be regarded,

as all individuals and classes may be regarded, in its possible relations to preceding, associated, and succeeding forms of art. The varied features observed upon the surface, the colors and patterns (Fig. 286), pertain to design rather than to form and will receive attention in the proper place.

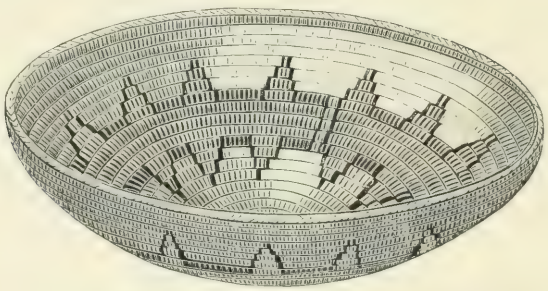

FIG. 287. Tray having decided esthetic attributes of form. Obtained from the Apache—½.

In point of contour the basket tray shown in Fig. 287 has a somewhat more decided claim upon esthetic attention than the preceding, as the curves exhibited mark a step of progress in complexity and grace. How much of this is due to intention and how much to technical perfection must remain in doubt. In work so perfect we are wont, however unwarrantably, to recognize the influence of taste.

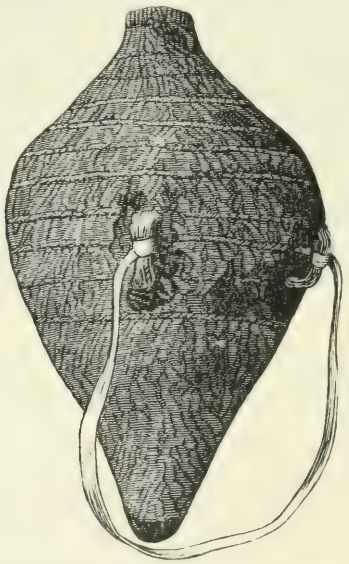

FIG. 288. Pyriform water vessel used by the Piute Indians—¼.

A third example—presented in Fig. 288—illustrates an advanced stage in the art of basketry and exhibits a highly specialized shape. The forces and influences concerned in its evolution may be analyzed as follows: A primal origin in function and a final adaptation to a

special function, the carrying and storing of water; a contour full to give capacity, narrow above for safety, and pointed below that it may be set in sand; curves kept within certain bounds by the limitations of construction; and a goodly share of variety, symmetry, and grace, the result to a certain undetermined extent of the esthetic tendencies of the artist's mind. In regard to the last point there is generally in forms so simple an element of uncertainty; but many examples may be found in which there is positive evidence of the existence of a strong desire on the part of the primitive basketmaker to enhance beauty of form. It will be observed that the textile materials and construction do not lend themselves freely to minuteness in detail or to complexity of outline, especially in those small ways in which beauty is most readily expressed.

Modifications of a decidedly esthetic character are generally suggested to the primitive mind by some functional, constructive, or accidental feature which may with ease be turned in the new direction. In the vessel presented in Fig. 289—the work of Alaskan

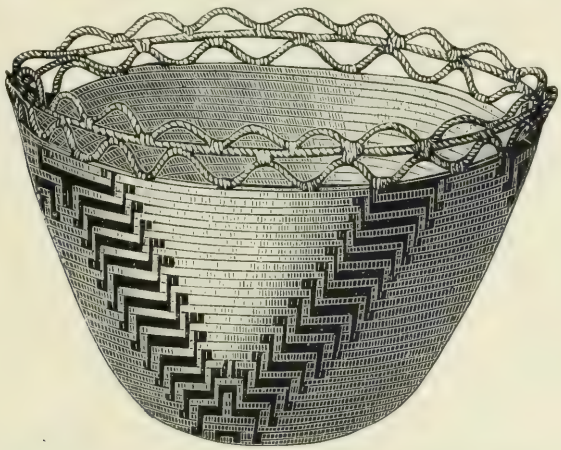

FIG. 289. Vessel with esthetic characters of form. Work of the Yakama. ¼.

Indians—the margin is varied by altering the relations of the three marginal turns of the coil, producing a scalloped effect. This is without reference to use, is uncalled for in construction, and hence is, in all probability, the direct result of esthetic tendencies. Other and much more elaborate examples may be found in the basketry of almost all countries.

In the pursuit of this class of enrichment there is occasionally noticeable a tendency to overload the subject with extraneous details. This is not apt to occur, however, in the indigenous practice of an art, but comes more frequently from a loss of equilibrium or balance in motives or desires, caused by untoward exotic influence. When, through suggestions derived from contact with civilized art, the savage undertakes to secure all the grace and complexity observed in the

works of more cultured peoples, he does so at the expense of construction and adaptability to use. An example of such work is presented in Fig. 290, a weak, useless, and wholly vicious piece of basketry.

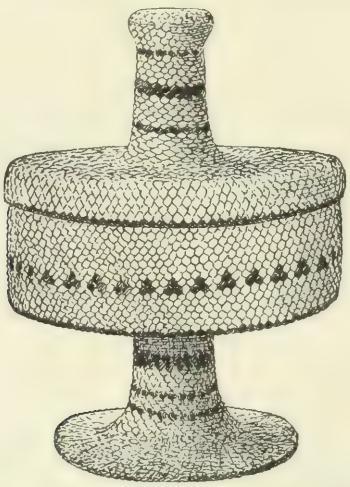

FIG. 290. Basket made under foreign influence, construction and use being sacrificed to fancied beauty — $\frac{1}{3}$.

Other equally meretricious pieces represent goblets, bottles, and tea pots. They are the work of the Indians of the northwest coast and are executed in the neatest possible manner, bearing evidence of the existence of cultivated taste.

It appears from the preceding analyses that *form* in this art is not sufficiently sensitive to receive impressions readily from the delicate touch of esthetic fingers; besides, there are peculiar difficulties in the way of detecting traces of the presence and supervision of taste. The inherent morphologic forces of the art are strong and stubborn and tend to produce the precise classes of results that we, at this stage of culture, are inclined to attribute to esthetic influence. If, in the making of a vessel, the demands of use are fully satisfied, if construction is perfect of its kind, if materials are uniformly suitable, and if models are not absolutely bad, it follows that the result must necessarily possess in a high degree those very attributes that all agree are pleasing to the eye.

In a primitive water vessel function gives a full outline, as capacity is a prime consideration; convenience of use calls for a narrow neck and a conical base; construction and materials unite to impose certain limitations to curves and their combinations, from which the artist cannot readily free himself. Models furnished by nature, as they are usually graceful, do not interfere with the preceding agencies, and all these forces united tend to give symmetry, grace, and the unity that belongs to simplicity. Taste which is in a formative state can but fall in with these tendencies of the art, and must be led

by them, and led in a measure corresponding to their persistency and universality. If the textile art had been the only one known to man, ideas of the esthetic in shape would have been in a great measure formed through that art. Natural forms would have had little to do with it except through models furnished directly to and utilized by the art, for the ideas of primitive men concentrate about that upon which their hands work and upon which their thoughts from necessity dwell with steady attention from generation to generation.

RELATIONS OF FORM TO ORNAMENT.

It would seem that the esthetic tendencies of the mind, failing to find satisfactory expression in shape, seized upon the non-essential features of the art — markings of the surface and color of filaments — creating a new field in which to labor and expending their energy upon ornament.

Shape has some direct relations to ornament, and these relations may be classified as follows:

First, the contour of the vessel controls its ornament to a large extent, dictating the positions of design and setting its limits; figures are in stripes, zones, rays, circles, ovals, or rectangles — according, in no slight measure, to the character of the spaces afforded by details of contour. Secondly, it affects ornament through the reproduction and repetition of features of form, such as handles, for ornamental purposes. Thirdly, it is probable that shape influences embellishment through the peculiar bias given by it to the taste and judgment of men prior to or independent of the employment of ornament.

COLOR IN TEXTILE ART.

Color is one of the most constant factors in man's environment, and it is so strongly and persistently forced upon his attention, so useful as a means of identification and distinction, that it necessarily receives a large share of consideration. It is probably one of the foremost objective agencies in the formation and development of the esthetic sense.

The natural colors of textile materials are enormously varied and form one of the chief attractions of the products of the art. The great interest taken in color — the great importance attached to it — is attested by the very general use of dyes, by means of which additional variety and brilliancy of effect are secured.

Color employed in the art is not related to use, excepting, perhaps, in symbolic and superstitious matters; nor is it of consequence in construction, although it derives importance from the manner in which construction causes it to be manifested to the eye. It finds its chief use in the field of design, in making evident to the eye the figures with which objects of art are embellished.

Color is employed or applied in two distinct ways: it is woven or

worked into the fabric by using colored filaments or parts, or it is added to the surface of the completed object by means of pencils, brushes, and dies. Its employment in the latter manner is especially convenient when complex ideographic or pictorial subjects are to be executed.

TEXTILE ORNAMENT.

DEVELOPMENT OF A GEOMETRIC SYSTEM OF DESIGN WITHIN THE ART.

INTRODUCTION.

Having made a brief study of form and color in the textile art, I shall now present the great group or family of phenomena whose exclusive office is that of enhancing beauty. It will be necessary, however, to present, besides those features of the art properly expressive of the esthetic culture of the race, all those phenomena that, being present in the art without man's volition, tend to suggest decorative conceptions and give shape to them. I shall show how the latter class of features arise as a necessity of the art, how they gradually come into notice and are seized upon by the esthetic faculty, and how under its guidance they assist in the development of a system of ornament of world wide application.

For convenience of treatment esthetic phenomena may be classed as *relieved* and *flat*. Figures or patterns of a relievo nature arise during construction as a result of the intersections and other more complex relations—the bindings—of the warp and woof or of inserted or applied elements. Flat or surface features are manifested in color, either in unison with or independent of the relieved details. Such is the nature of the textile art that in its ordinary practice certain combinations of both classes of features go on as a necessity of the art and wholly without reference to the desire of the artist or to the effect of resultant patterns upon the eye. The character of such figures depends upon the kind of construction and upon the accidental association of natural colors in construction.

At some period of the practice of the art these peculiar, adventitious surface characters began to attract attention and to be cherished for the pleasure they gave; what were at first adventitious features now took on functions peculiar to themselves, for they were found to gratify desires distinct from those cravings that arise directly from physical wants.

It is not to be supposed for a moment that the inception of esthetic notions dates from this association of ideas of beauty with textile characters. Long before textile objects of a high class were made, ideas of an esthetic nature had been entertained by the mind, as, for example, in connection with personal adornment. The skin had been painted, pendants placed about the neck, and bright feathers set in the hair to enhance attractiveness, and it is not difficult to

conceive of the transfer of such ideas from purely personal associations to the embellishment of articles intimately associated with the person. No matter, however, what the period or manner of the association of such ideas with the textile art, that association may be taken as the datum point in the development of a great system of decoration whose distinguishing characters are the result of the geometric textile construction.

In amplifying this subject I find it convenient to treat separately the two classes of decorative phenomena — the relieved and the flat — notwithstanding the fact that they are for the most part intimately associated and act together in the accomplishment of a common end.

RELIEF PHENOMENA.

Ordinary features.—The relieved surface characters of fabrics resulting from construction and available for decoration are more or less distinctly perceptible to the eye and to the touch and are susceptible of unlimited variation in detail and arrangement. Such features are familiar to all in the strongly marked ridges of basketry, and much more pleasingly so in the delicate figures of damasks, embroideries, and laces. So long as the figures produced are confined exclusively to the necessary features of unembellished construction, as is the case in very primitive work and in all plain work, the resultant patterns are wholly geometric and by endless repetition of like parts extremely monotonous.

In right angled weaving the figures combine in straight lines, which run parallel or cross at uniform distances and angles. In radiate weaving, as in basketry, the radial lines are crossed in an equally formal manner by concentric lines. In other classes of combination there is an almost equal degree of geometricity.

When, however, with the growth of intelligence and skill it is found that greater variety of effect can be secured by modifying the essential combinations of parts, and that, too, without interfering with constructive perfection or with use, a new and wide field is opened for the developmental tendencies of textile decoration.

Moreover, in addition to the facilities afforded by the necessary elements of construction, there are many extraneous resources of which the textile decorator may freely avail himself. The character of these is such that the results, however varied, harmonize thoroughly with indigenous textile forms.

To make these points quite clear it will be necessary to analyze somewhat closely the character and scope of textile combination and of the resultant and associated phenomena.

We may distinguish two broad classes of constructive phenomena made use of in the expression of relieved enrichment. As indicated above, these are, first, essential or actual constructive features and, second, extra or superconstructive features.

First, it is found that in the practice of primitive textile art a variety of methods of combination or bindings of the parts have been evolved and utilized, and we observe that each of these — no matter what the material or what the size and character of the filamental elements — gives rise to distinct classes of surface effects. Thus it appears that peoples who happen to discover and use like combinations produce kindred decorative results, while those employing unlike constructions achieve distinct classes of surface embellishment. These constructive peculiarities have a pretty decided effect upon the style of ornament, relieved or colored, and must be carefully considered in the treatment of design; but it is found that each type of combination has a greatly varied capacity of expression, tending to obliterate sharp lines of demarkation between the groups of results. It sometimes even happens that in distinct types of weaving almost identical surface effects are produced.

It will not be necessary in this connection to present a full series of the fundamental bindings or orders of combination, as a few will suffice to illustrate the principles involved and to make clear the bearing of this class of phenomena upon decoration. I choose, first, a number of examples from the simplest type of weaving, that in which the web and the woof are merely interlaced, the filaments crossing at right angles or nearly so. In Fig. 291 we have the result exhibited in a plain open or reticulated fabric constructed from ordinary untwisted fillets, such as are employed in our splint and cane products. Fig. 292 illustrates the surface produced by crowding the horizontal series

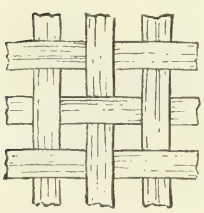

FIG. 291. Surface relief in simplest form of intersection.

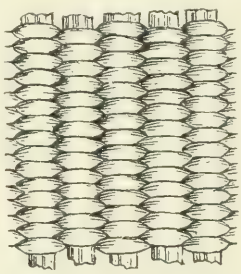

FIG. 292. Surface relief produced by horizontal series crowded together.

FIG. 293. Surface relief produced by wide fillets set close together.

of the same fabric close together, so that the vertical series is entirely hidden. The surface here exhibits a succession of vertical ribs, an effect totally distinct from that seen in the preceding example. The third variety (Fig. 293) differs but slightly from the first. The fillets are wider and are set close together without crowding, giving the surface a checkered appearance.

The second variety of surface effect is that most frequently seen in the basketry of our western tribes, as it results from the great degree of compactness necessary in vessels intended to contain liquids,

semiliquid foods, or pulverized substances. The general surface effect given by closely woven work is illustrated in Fig. 294, which represents a large wicker carrying basket obtained from the Moki

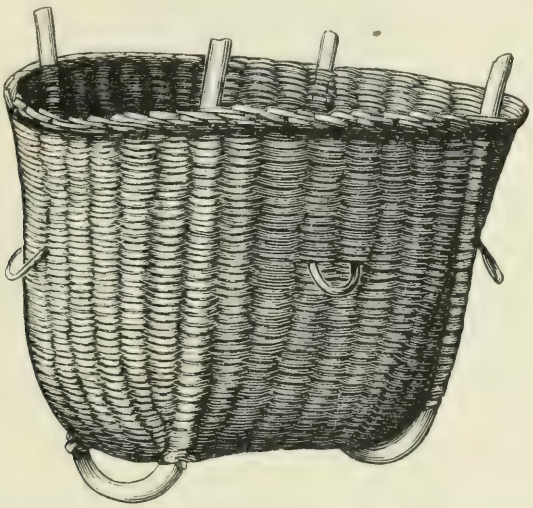

FIG. 294. Basket showing ribbed surface produced by impacting the horizontal or concentric filaments. Moki work ¼.

Indians. In this instance the ridges, due to a heavy series of radiating warp filaments, are seen in a vertical position.

It will be observed, however, that the ridges do not *necessarily* take

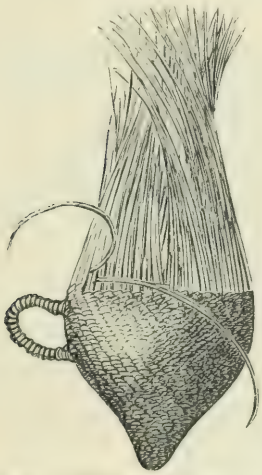

FIG. 295. Alternation of intersection, producing oblique or spiral ribs. Piute work ¼.

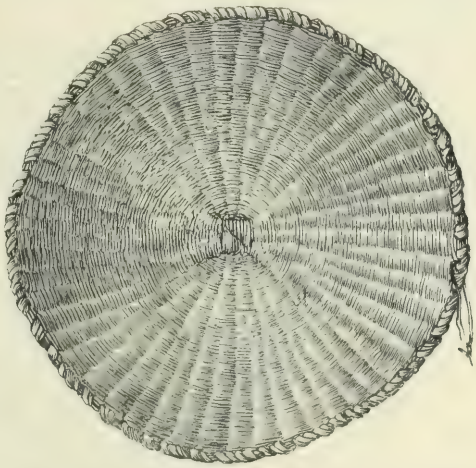

FIG. 296. Radiating ribs as seen in flat work viewed from above. Moki work ¼.

the direction of the warp filaments, for, with a different alternation of the horizontal series—the woof—we get oblique ridges, as shown in the partly finished bottle illustrated in Fig. 295. They are, how-

ever, not so pronounced as in the preceding case. The peculiar effect of radiate and concentric weaving upon the ribs is well shown in Fig. 296.

By changes in the order of intersection, without changing the type of combination, we reach a series of results quite unlike the preceding; so distinct, indeed, that, abstracted from constructive relationships, there would be little suggestion of correlation. In the example

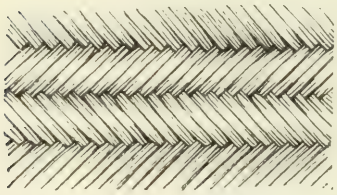

FIG. 297. Diagonal combination, giving herring bone effect.

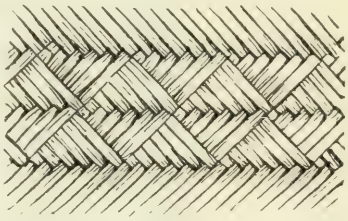

FIG. 298. Elaboration of diagonal combination, giving triangular figures.

given in Fig. 297 the series of filaments interlace, not by passing over and under alternate strands, as in the preceding set of examples, but by extending over and under a number of the opposing series at each step and in such order as to give wide horizontal ridges ribbed diagonally.

This example is from an ancient work basket obtained at Ancon, Peru, and shown in Fig. 299. The surface features are in strong relief, giving a pronounced herring bone effect.

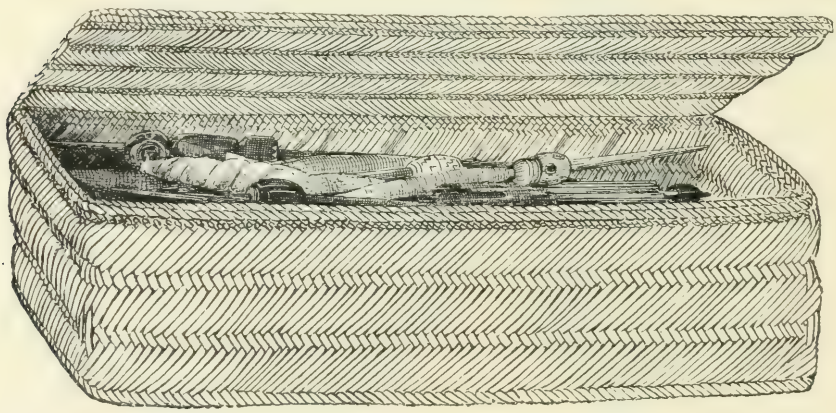

FIG. 299. Peruvian work basket of reeds, with strongly relieved ridges.

Slight changes in the succession of parts enable the workman to produce a great variety of decorative patterns, an example of which is shown in Fig. 298. A good illustration is also seen in Fig 286, and another piece, said to be of Seminole workmanship, is given in Fig. 300. These and similar relieved results are fruitful sources of primitive decorative motives. They are employed not only within

the art itself, but in many other arts less liberally supplied with suggestions of embellishment.

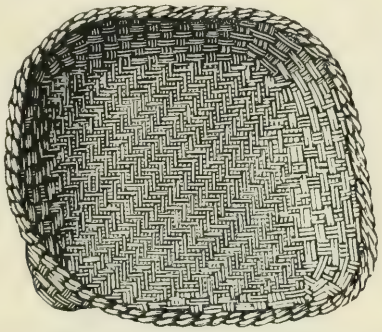

FIG. 300. Effects produced by varying the order of intersection. Seminole work — ¼.

Taking a second type of combination, we have a family of resultant patterns in the main distinguishable from the preceding.

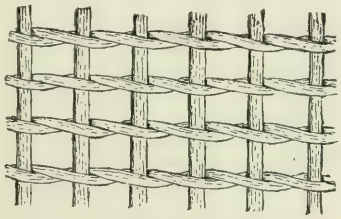

FIG. 301. Surface effect in open twined combination.

Fig. 301 illustrates the simplest form of what Dr. O. T. Mason has called the twined combination, a favorite one with many of our native tribes. The strands of the woof series are arranged in twos and in

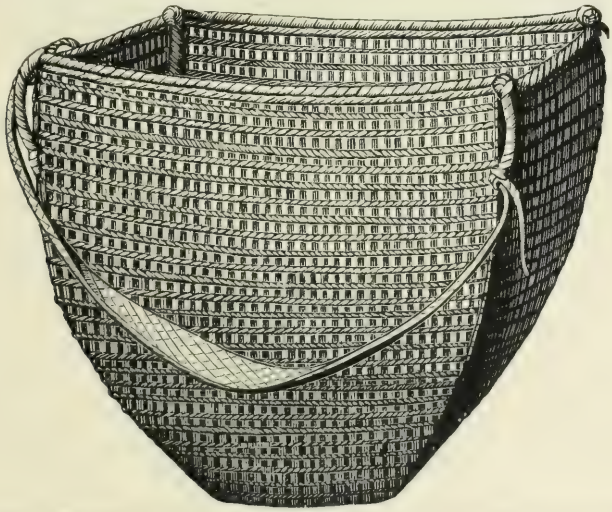

FIG. 302. Surface effect of twined, lattic combination in basketry of the Clallam Indians of Washington Territory — ¼.

weaving are twisted half around at each intersection, inclosing the opposing fillets. The resulting open work has much the appearance of ordinary netting, and when of pliable materials and distended or strained over an earthen or gourd vessel the pattern exhibited is strikingly suggestive of decoration. The result of this combination upon a lattice foundation of rigid materials is well shown in the large basket presented in Fig. 302. Other variants of this type are given in the three succeeding figures.

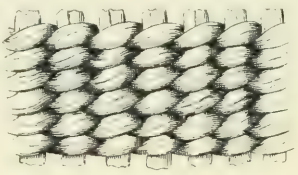

FIG. 303. Surface effect in impacted work of twined combination.

The result seen in Fig. 303 is obtained by impacting the horizontal or twined series of threads. The surface is nearly identical with that of the closely impacted example of the preceding type (Fig. 292). The peculiarities are more marked when colors are used. When the doubled and twisted series of strands are placed far apart and the opposing series are laid side by side a pleasing result is given, as shown in Fig. 304 and in the body of the conical basket illustrated in Fig. 307.

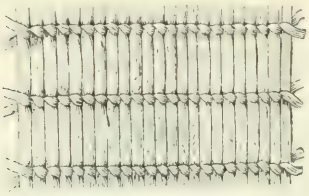

FIG. 304. Surface effect obtained by placing the warp strands close together and the woof cables far apart.

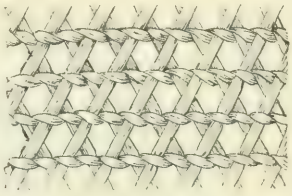

FIG. 305. Surface effect obtained by crossing the warp series in open twined work.

In Fig. 305 we have a peculiar diagonally crossed arrangement of the untwisted series of filaments, giving a lattice work effect.

Fig. 306 serves to show how readily this style of weaving lends

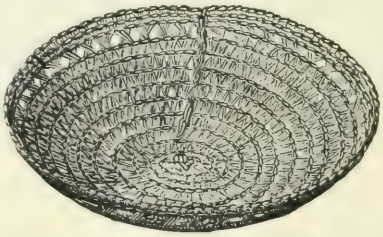

FIG. 306. Decorative effects produced by variations in the radiate or warp series in an open work tray. Klamath work.—¼.

itself to the production of decorative modification, especially in the direction of the concentric zonal arrangement so universal in vessel-making arts.

The examples given serve to indicate the unlimited decorative resources possessed by the art without employing any but legitimate constructive elements, and it will be seen that still wider results can be obtained by combining two or more varieties or styles of binding in the construction and the embellishment of a single object or in the same piece of fabric. A good, though very simple, illustration of this is shown in the tray or mat presented in Fig. 286. In this case a border, varying from the center portion in appearance, is obtained by changing one series of the filaments from a multiple to a single arrangement.

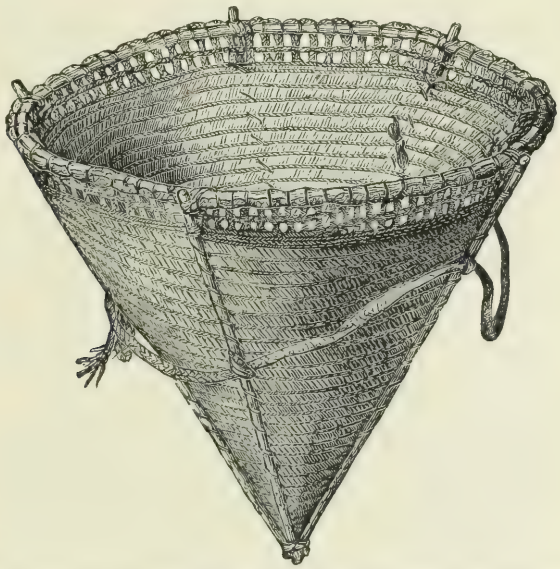

FIG. 307. Conical basket of the Klamath Indians of Oregon, showing peculiar twined effect and an open work border — ¼.

The conical basket shown in Fig. 307 serves to illustrate the same point. In this case a rudely worked, though effective, border is secured by changing the angle of the upright series near the top and combining them by plaiting, and in such a way as to leave a border of open work.

Now the two types of construction, the interlaced and the twined, some primitive phases of which have been reviewed and illustrated, as they are carried forward in the technical progress of the art, exhibit many new features of combination and resultant surface character, but the elaboration is in all cases along lines peculiar to these types of weaving.

Other types of combination of web and woof, all tapestry, and all

braiding, netting, knitting, crochet, and needle work exhibit characters peculiar to themselves, developing distinct groups of relieved results; yet all are analogous in principle to those already illustrated and unite in carrying forward the same great geometric system of combination.

Reticulated work.—A few paragraphs may be added here in regard to reticulated fabrics of all classes of combination, as they exhibit more than usually interesting relievo phenomena and have a decided bearing upon the growth of ornament.

In all the primitive weaving with which we are acquainted definite reticulated patterns are produced by variations in the spacings and other relations of the warp and woof; and the same is true in all the higher forms of the art. The production of reticulated work is the especial function of netting, knitting, crocheting, and certain varieties of needlework, and a great diversity of relieved results are produced, no figure being too complex and no form too pronounced to be undertaken by ambitious workmen.

In the following figures we have illustrations of the peculiar class of primitive experiments that, after the lapse of ages, lead up to marvelous results, the highest of which may be found in the exquisite laces of cultured peoples. The Americans had only taken the first steps in this peculiar art, but the results are on this account of especial interest in the history of the art.

An example of simple reticulated hand weaving is shown in Fig. 308. It is the work of the mound builders and is taken from an impression upon an ancient piece of pottery obtained in Tennessee.

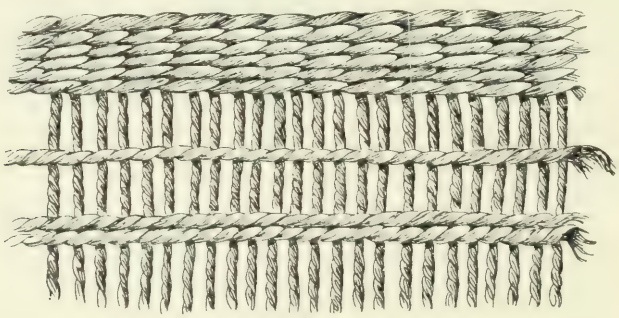

FIG. 308. Incipient stage of reticulated ornament. Fabric of the mound builders.

Fig. 309 illustrates a bit of ancient Peruvian work executed on a frame or in a rude loom, a checker pattern being produced by arranging the warp and woof now close together and now wide apart.

Open work of this class is sometimes completed by after processes, certain threads or filaments being drawn out or introduced, by which means the figures are emphasized and varied.

In Fig. 310 we have a second Peruvian example in which the woof threads have been omitted for the space of an inch, and across this

interval the loose warp has been plaited and drawn together, producing a lattice-like band.

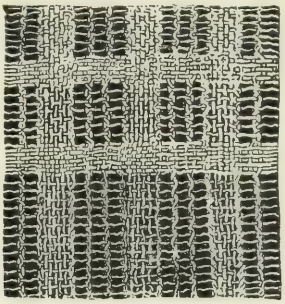

FIG. 309. Simple form of ornamental reticulation. Ancient Peruvian work.

In a similar way four other bands of narrow open work are introduced, two above and two below the wide band. These are produced

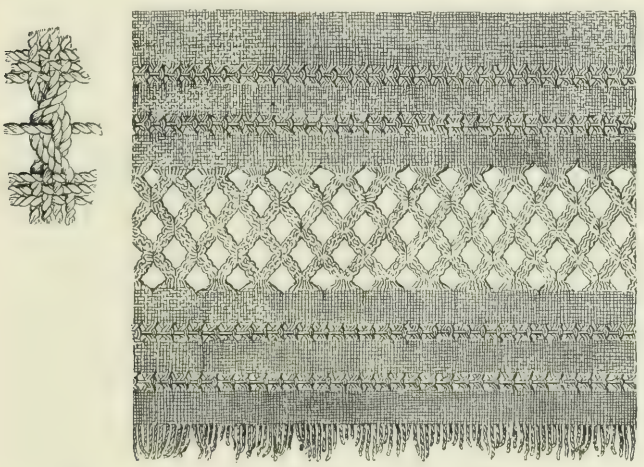

FIG. 310. Reticulated pattern in cotton cloth. Work of the ancient Peruvians.

by leaving the warp threads free for a short space and drawing alternate pairs across each other and fixing them so by means of a woof thread, as shown in the cut.

Examples of netting in which decorative features have been worked are found among the textile products of many American tribes and occur as well in several groups of ancient fabrics, but in most cases where designs of importance or complexity are desired parts are introduced to facilitate the work.

Superconstructive features.—These features, so important in the decoration of fabrics, are the result of devices by which a construction already capable of fulfilling the duties imposed by function has added to it parts intended to enhance beauty and which may or may not be of advantage to the fabric. They constitute one of the most

widely used and effective resources of the textile decorator, and are added by sewing or stitching, inserting, drawing, cutting, applying, appending, &c. They add enormously to the capacity for producing relievo effects and make it possible even to render natural forms in the round. Notwithstanding this fact—the most important section of this class of features—embroidery is treated to better advantage under color phenomena, as color is very generally associated with the designs.

One example of lace-like embroidery may be given in this place. It is probably among the best examples of monochrome embroidery America has produced. In design and in method of realization it is identical with the rich, colored embroideries of the ancient Peruvians, being worked upon a net foundation, as shown in Fig. 311. The broad

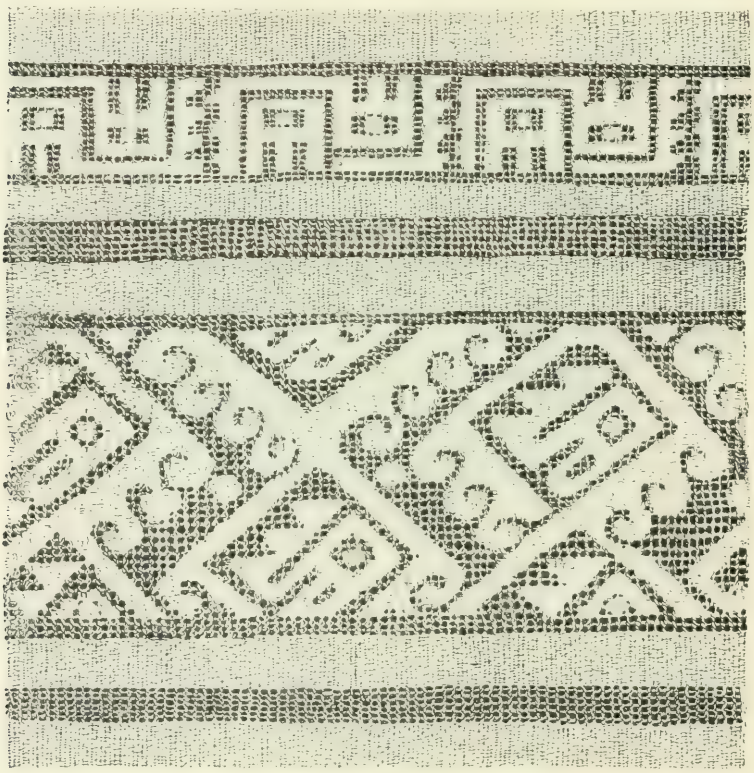

FIG. 311. Open work design embroidered upon a net-like fabric. From a grave at Ancon, Peru.

band of figures employs bird forms in connection with running geometric designs, and still more highly conventional bird forms are seen in the narrow band.

Appended ornaments are not amenable to the geometric laws of fabrication to the extent observed in other classes of ornament. They

are, however, attached in ways consistent with the textile system, and are counted and spaced with great care, producing designs of a more or less pronounced geometric character. The work is a kind of embroidery, the parts employed being of the nature of pendants.

These include numberless articles derived from nature and art. It will suffice to present a few examples already at hand.

Fig. 312 illustrates a large, well made basket, the work of the Apache Indians. It serves to indicate the method of employing tassels and clustered pendants, which in this case consist of buckskin

FIG. 312. Basket with pendent buckskin strands tipped with bits of tin. Apache Indians — $\frac{1}{8}$

strings tipped with conical bits of tin. The checker pattern is in color.

Fig. 313 illustrates the use of other varieties of pendants. A feather decked basket made by the northwest coast Indians is em-

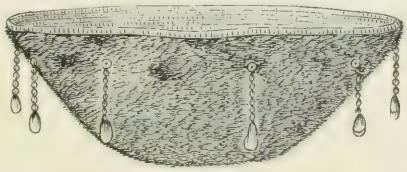

FIG. 313. Basket with pendants of beads and bits of shell, work of the northwest coast Indians. - $\frac{1}{4}$.

bellished with pendent ornaments consisting of strings of beads tipped with bits of bright shell. The importance of this class of work in higher forms of textiles may be illustrated by an example from Peru. It is probable that American art has produced few examples of tasseled work more wonderful than that of which a fragment is shown in Fig. 314. It is a fringed mantle, three feet in length and nearly the same in depth, obtained from an ancient tomb. The body is made up of separately woven bands, upon which disk-like and

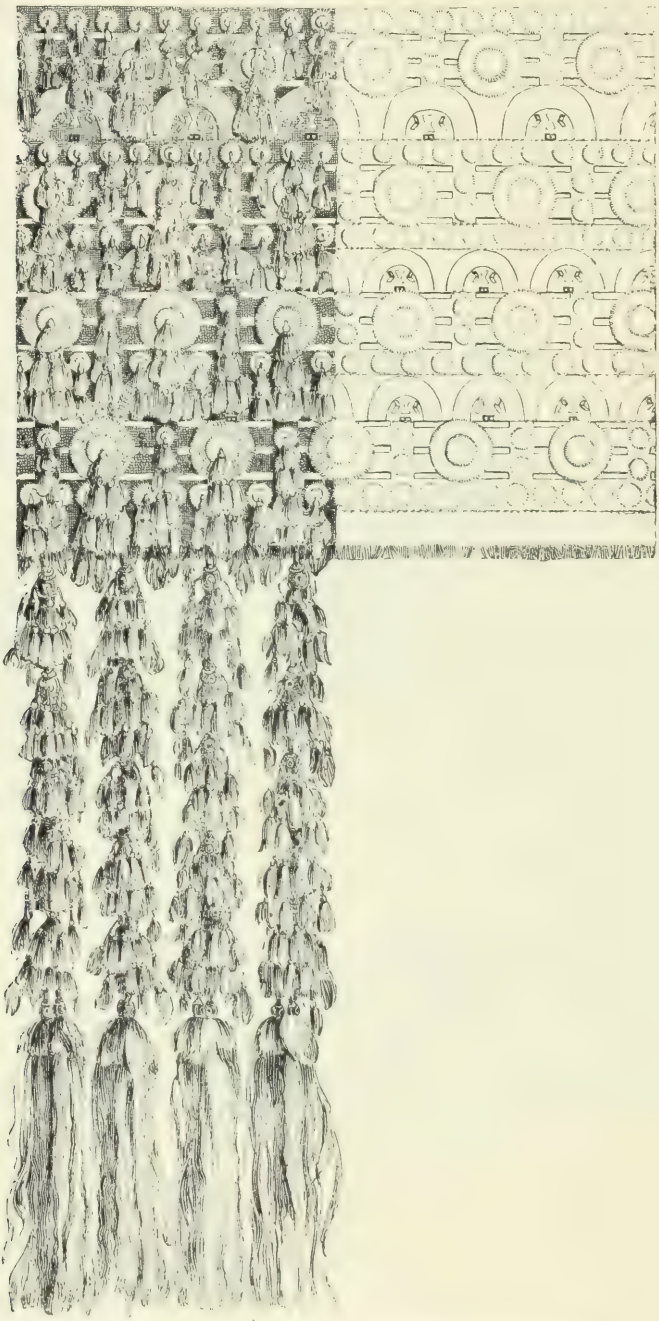

Fig. 314. Tassel ornamentation from an ancient Peruvian mantle.

semilunar figures representing human faces are stitched, covering the surface in horizontal rows. To the center of these rosette-like parts clusters of tassels of varying sizes are attached. The fringe, which is twenty inches deep, is composed entirely of long strings of tassels, the larger tassels supporting clusters of smaller ones. There are upwards of three thousand tassels, the round heads of which are in many cases woven in colors, ridges, and nodes to represent the human features. The general color of the garment, which is of fine, silky wool, is a rich crimson. The illustration can convey only a hint of the complexity and beauty of the original.

We have now seen how varied and how striking are the surface characters of fabrics as expressed by the third dimension, by variation from a flat, featureless surface, and how all, essential and ornamental, are governed by the laws of geometric combination. We shall now see how these are related to color phenomena.

COLOR PHENOMENA.

Ordinary features.—In describing the constructive characters of fabrics and the attendant surface phenomena, I called attention to the fact that a greater part of the design manifested is enforced and supplemented by color, which gives new meaning to every feature. Color elements are present in the art from its very inception, and many simple patterns appear as accidents of textile aggregation long before the weaver or the possessor recognizes them as pleasing to the eye. When, finally, they are so recognized and a desire for greater elaboration springs up, the textile construction lends itself readily to the new office and under the esthetic forces brings about wonderful results without interfering in the least with the technical perfection of the articles embellished. But color is not confined to the mere emphasizing of figures already expressed in relief. It is capable of advancing alone into new fields, producing patterns and designs complex in arrangement and varied in hue, and that, too, without altering the simple, monotonous succession of relievo characters.

In color, as in relieved design, each species of constructive combination gives rise to more or less distinct groups of decorative results, which often become the distinguishing characteristics of the work of different peoples and the progenitors of long lines of distinctions in national decorative conceptions.

In addition to this apparently limitless capacity for expression, lovers of textile illumination have the whole series of extraordinary resources furnished by expedients not essential to ordinary construction, the character and scope of which have been dwelt upon to some extent in the preceding section.

I have already spoken of color in a general way, as to its necessary presence in art, its artificial application to fabrics and fabric mate-

rials, its symbolic characters, and its importance to esthetic progress. My object in this section is to indicate the part it takes in textile design, its methods of expression, the processes by which it advances in elaboration, and the part it takes in all geometric decoration.

It will be necessary, in the first place, to examine briefly the normal tendencies of color combination while still under the direct domination of constructive elaboration. In the way of illustration, let us take first a series of filaments, say in the natural color of the material, and pass through them in the simplest interlaced style a second series having a distinct color. A very simple geometric pattern is produced, as shown in Fig. 315. It is a sort of checker, an emphasized presentation of the relievo pattern shown in Fig. 291, the figures running horizontally, vertically, and diagonally. Had these filaments been accidentally associated in construction, the results might

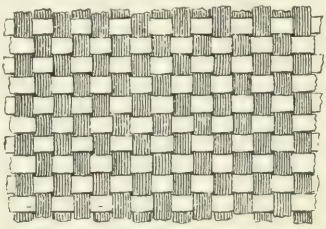

FIG. 315. Pattern produced by interlacing strands of different colors.

have been the same, but it is unnecessary to indicate in detail the possibilities of adventitious color combinations. So far as they exhibit system at all it is identical with the relievo elaboration.

Assuming that the idea of developing these figures into something more elaborate and striking is already conceived, let us study the processes and tendencies of growth. A very slight degree of ingenuity will enable the workman to vary the relation of the parts, producing a succession of results such, perhaps, as indicated in Fig. 316.

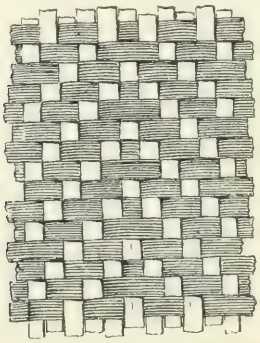

FIG. 316. Pattern produced by modifying the alternation of fillets.

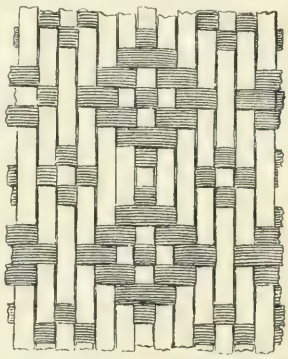

FIG. 317. Isolated figures produced by modifying the order of intersection.

In this example we have rows of isolated squares in white which may be turned hither and thither at pleasure, within certain angles, but they result in nothing more than monotonous successions of squares.

Additional facility of expression is obtained by employing dark strands in the vertical series also, and large, isolated areas of solid color may be produced by changing the order of intersection, certain of the fillets being carried over two or more of the opposing series and in contiguous spaces at one step, as seen in Fig. 317. With these elementary resources the weaver has very considerable powers of expression, as will be seen in Fig. 318, which is taken from a basket

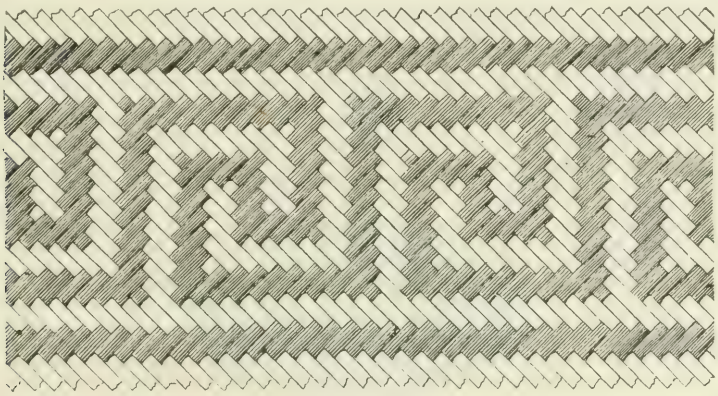

FIG. 318. Pattern produced by simple alternations of light and dark fillets. Basketry of the Indians of British Guiana.

made by South American Indians, and in Fig. 341, where human figures are delineated. The patterns in such cases are all rigidly geometric and exhibit stepped outlines of a pronounced kind. With impacting and increased refinement of fillets the stepped character is in a considerable measure lost sight of and realistic, graphic representation is to a greater extent within the workman's reach. It is probable, however, that the idea of weaving complex ideographic characters would not occur to the primitive mind at a very early date, and a long period of progress would elapse before delineative subjects would be attempted.

I do not need to follow this style of combination into the more refined kinds of work and into loom products, but may add that through all, until perverted by ulterior influences, the characteristic geometricity and monotonous repetition are allpervading.

For the purpose of looking still more closely into the tendencies of normal textile decorative development I shall present a series of Indian baskets, choosing mainly from the closely woven or impacted varieties because they are so well represented in our collections and

at the same time are so very generally embellished with designs in color; besides, they are probably among the most simple and primitive textile products known. I have already shown that several types of combination when closely impacted produce very similar surface characters and encourage the same general style of decoration. In nearly all, the color features are confined to one series of fillets — those of the woof — the other, the warp, being completely hidden from view. In the preceding series the warp and woof were almost equally concerned in the expression of design. Here but one is used, and in consequence there is much freedom of expression, as the artist carries the colored filaments back and forth or inserts new ones at will. Still it will be seen that in doing this he is by no means free; he must follow the straight and narrow pathway laid down by the warp and woof, and, do what he may, he arrives at purely geometric results.

I will now present the examples, which for the sake of uniformity are in all cases of the coiled ware. If a basket is made with no other idea than that of use the surface is apt to be pretty uniform in color, the natural color of the woof fillets. If decoration is desired a col-

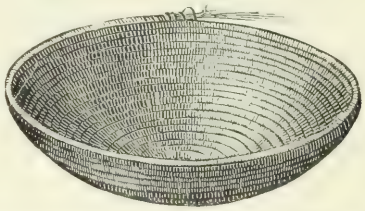

FIG. 319. Base of coiled basket showing the method of building by dual coiling. The base or warp coil is composed of untwisted fiber and is formed by adding to the free end as the coiling goes on. The woof or binding filament, as it is coiled, is caught into the upper surface of the preceding turn ½.

ored fillet is introduced, which, for the time, takes the place and does the duty of the ordinary strand. Fig. 319 serves to show the construction and surface appearance of the base of a coil made vessel still quite free from any color decoration. Now, if it is desired to begin a design, the plain wrapping thread is dropped and a colored

FIG. 320. Coiled basket with simple geometric ornament. Work of the northwest coast Indians — ¼.

fillet is inserted and the coiling continues. Carried once around the vessel we have an encircling line of dark color corresponding to the lower line of the ornament seen in Fig. 320. If the artist is content with a single line of color he sets the end of the dark thread and takes up the light colored one previously dropped and continues the coiling. If further elaboration is desired it is easily accomplished. In the example given the workman has taken up the dark fillet again and carried it a few times around the next turn of the warp coil; then it has been dropped and the white thread taken up, and again, in turn, another dark thread has been introduced and coiled for a few turns, and so on until four encircling rows of dark, alternating rectangles have been produced. Desiring to introduce a meandered design he has taken the upper series of rectangles as bases and adding colored filaments at the proper time has carried oblique lines, one to the right and the other to the left, across the six succeeding ridges of the warp coil. The pairs of stepped lines meeting above were joined in rectangles like those below, and the decoration was closed by a border line at the top. The vessel was then completed in the light colored material. In this ornament all forms are bounded by two classes of lines, vertical and horizontal (or, viewed from above or below, radial and encircling), the lines of the warp and the woof. Oblique bands of color are made up of series of rectangles, giving stepped outlines. Although these figures are purely geometric, it is not impossible that in their position and grouping they preserve a trace of some imitative conception modified to this shape by the forces of the art. They serve quite as well, however, to illustrate simple mechanical elaboration as if entirely free from suspicion of associated ideas.

In Fig. 321 I present a superb piece of work executed by the Indians of the Tule River, California. It is woven in the closely im-

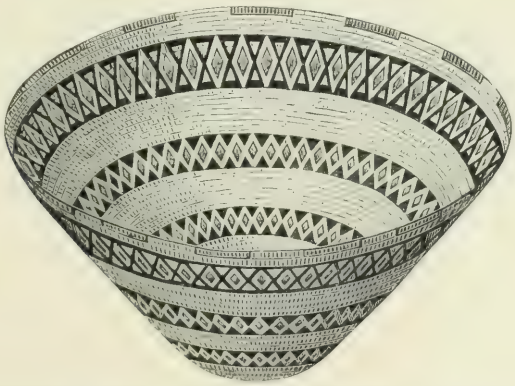

FIG. 321. Coiled basket with encircling bands of ornament in white, red, and black, upon a yellowish ground. Obtained from the Indians of the Tule River, California. ¼.

pacted, coiled style. The ornament is arranged in horizontal zones and consists of a series of diamond shaped figures in white with red

centers and black frames set side by side. The processes of substitution where changes of color are required are the same as in the preceding case and the forms of figures and the disposition of designs are the same, being governed by the same forces.

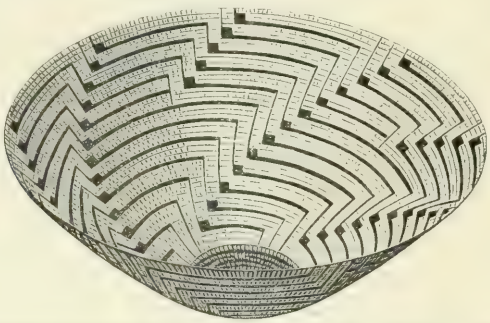

FIG. 322. Coiled basket with ornament arranged in zigzag rays. Obtained from the Pima Indians of Arizona — ½.

Another choice piece, from the Pima Indians of Arizona, is given in Fig. 322. The lines of the ornament adhere exclusively to the directions imposed by the warp and the woof, the stripes of black color ascending with the turns of the fillet for a short distance, then for a time following the horizontal ridges, and again ascending, the complete result being a series of zigzag rays set very close together. These rays take an oblique turn to the left, and the dark figures at the angles, from the necessities of construction, form rows at right angles to these. A few supplementary rays are added toward the margin to fill out the widening spaces. Another striking example of the domination of technique over design is illustrated in Fig. 323.

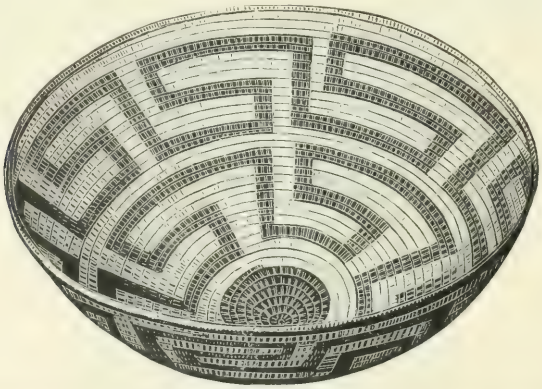

FIG. 323. Coiled basket with two bands of meandered ornament. Obtained from the Pima Indians of Arizona — ½.

Two strongly marked, fret-like meanders encircle the vessel, the elements of which are ruled exclusively by the warp and woof, by the radiate and the concentric lines of construction. This is the work of the Pima Indians of Arizona.

I shall close the series with a very handsome example of Indian basketry and of basketry ornamentation (Fig. 324). The conical shape is highly pleasing and the design is thoroughly satisfactory and, like all the others, is applied in a way indicative of a refined sense

FIG. 324. Coiled basket with geometric ornament composed of triangular figures. Obtained from the McCloud River Indians, California--$\frac{1}{3}$.

of the decorative requirements of the utensil. The design is wholly geometric, and, although varied in appearance, is composed almost exclusively of dark triangular figures upon a light ground. The general grouping is in three horizontal or encircling bands agreeing with or following the foundation coil. Details are governed by the horizontal and the oblique structure lines. The vertical construction lines have no direct part in the conformation of the design excepting in so far as they impose a stepped character upon all oblique outlines.

These studies could be carried through all the types of primitive textile combination, but such a work seems unnecessary, for in all cases the elaboration in design, relieved and colored, is along similar lines, is governed by the same class of forces, and reaches closely corresponding results.

We have observed throughout the series of examples presented a decided tendency toward banded or zonal arrangement of the ornamentation. Now each of these bands is made up of a number of units, uniform in shape and in size and joined or linked together in various suitable and consistent ways. In contemplating them we are led to inquire into the nature of the forces concerned in the accomplishment of such results. The question arises as to exactly how

much of the segregating and aggregating forces or tendencies belongs to the technique of the art and how much to the direct esthetic supervision of the human agent, questions as to ideographic influence being for the present omitted. This is a difficult problem to deal with, and I shall not attempt more here than to point out the apparent teachings of the examples studied.

The desires of the mind constitute the motive power, the force that gives rise to all progress in art; the appreciation of beauty and the desire to increase it are the cause of all progress in purely decorative elaboration. It appears, however, that there is in the mind no preconceived idea of what that elaboration should be. The mind is a growing thing and is led forward along the pathways laid out by environment. Seeking in art gratification of an esthetic kind it follows the lead of technique along the channels opened by such of the useful arts as offer suggestions of embellishment. The results reached vary with the arts and are important in proportion to the facilities furnished by the arts. As I have already amply shown, the textile art possesses vast advantages over all other arts in this respect, as it is first in the field, of widest application, full of suggestions of embellishment, and inexorably fixed in its methods of expression. The mind in its primitive, mobile condition is as clay in the grasp of technique.

A close analysis of the forces and the influences inherent in the art will be instructive. For the sake of simplicity I exclude from consideration all but purely mechanical or non-ideographic elements. It will be observed that order, uniformity, symmetry, are among the first lessons of the textile art. From the very beginning the workman finds it necessary to direct his attention to these considerations in the preparation of his material as well as in the building of his utensils. If parts employed in construction are multiple they must be uniform, and to reach definite results (presupposing always a demand for such results), either in form or ornament, there must be a constant counting of numbers and adjusting to spaces. The most fundamental and constant elements embodied in textile art and available for the expression of embellishment are the minute steps of the intersections or bindings; the most necessary and constant combination of these elements is in continuous lines or in rows of isolated figures; the most necessary and constant directions for these combinations are with the web and the woof, or with their complementaries, the diagonals. If large areas are covered certain separation or aggregation of the elements into larger units is called for, as otherwise absolute sameness would result. Such separation or aggregation conforms to the construction lines of the fabric, as any other arrangement would be unnatural and difficult of accomplishment. When the elements or units combine in continuous zones, bands, or rays they are placed side by side in simple juxtaposition or are united

in various ways, always following the guide lines of construction through simple and complex convolutions. Whatever is done is at the suggestion of technique; whatever is done takes a form and arrangement imposed by technique. Results are like in like techniques and are unlike in unlike techniques; they therefore vary with the art and with its variations in time and character.

All those agencies pertaining to man that might be supposed important in this connection — the muscles of the hand and of the eye, the cell structure of the brain, together with all preconceived ideas of the beautiful — are all but impotent in the presence of technique, and, so far as forms of expression go, submit completely to its dictates. Ideas of the beautiful in linear geometric forms are actually formed by technique, and taste in selecting as the most beautiful certain ornaments produced in art is but choosing between products that in their evolution gave it its character and powers, precisely as the animal selects its favorite foods from among the products that throughout its history constitute its sustenance and shape its appetites.

Now, as primitive peoples advance from savagery to barbarism there comes a time in the history of all kinds of textile products at which the natural technical progress of decorative elaboration is interfered with by forces from without the art. This occurs when ideas, symbolic or otherwise, come to be associated with the purely geometric figures, tending to arrest or modify their development, or, again, it occurs when the artist seeks to substitute mythologic subjects for the geometric units. This period cannot be always well defined, as the first steps in this direction are so thoroughly subordinated to the textile forces. Between what may be regarded as purely technical, geometric ornament and ornament recognizably delineative, we find in each group of advanced textile products a series of forms of mixed or uncertain pedigree. These must receive slight attention here.

Fig. 325 represents a large and handsome basket obtained from the

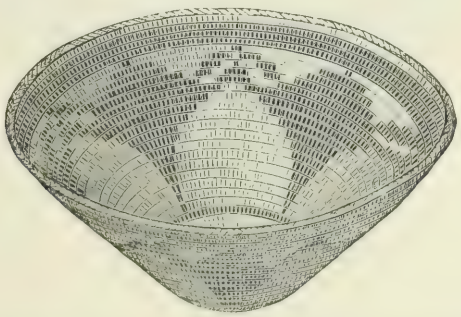

FIG. 325. Coiled basket ornamented with devices probably very highly conventionalized mythological subjects. Obtained from the Apache. ⅛.

Apache. It will be seen that the outline of the figures comprising the principal zone of ornament departs somewhat from the four ruling directions of the textile combination. This was accomplished by increasing the width of the steps in the outline as the dark rays progressed, resulting in curved outlines of eccentric character. This eccentricity, coupled with the very unusual character of the details at the outer extremities of the figures, leads to the surmise that each part of the design is a conventional representation of some life form, a bird, an insect, or perhaps a man.

By the free introduction of such elements textile ornament loses its pristine geometric purity and becomes in a measure degraded. In the more advanced stages of Pueblo art the ornament of nearly all the textiles is pervaded by ideographic characters, generally rude suggestions of life forms, borrowed, perhaps, from mythologic art. This is true of much of the coiled basketry of the Moki Indians. True, many examples occur in which the ancient or indigenous geometric style is preserved, but the majority appear to be more or less modified. In many cases nothing can be learned from a study of the designs themselves, as the particular style of construction is not adapted to realistic expression, and, at best, resemblances to natural forms are very remote. Two examples are given in Figs.

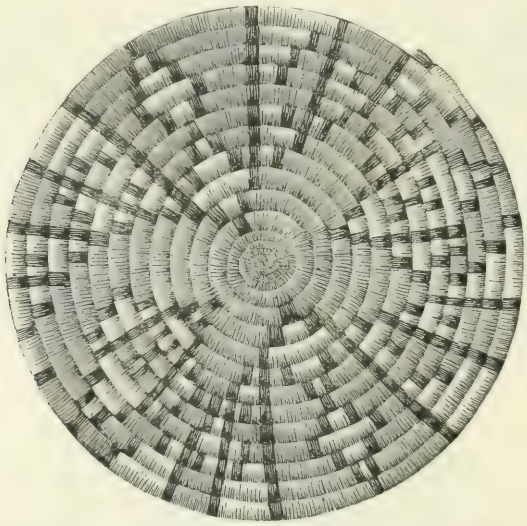

FIG. 326. Coiled tray with geometric devices probably modified by ideographic association. Moki work — ¼.

326 and 327. I shall expect, however, when the art of these peoples is better known, to learn to what particular mythic concept these mixed or impure geometric devices refer.

The same is true of other varieties of Pueblo basketry, notably the common decorated wickerware, two specimens of which are

given in Figs. 328 and 329. This ware is of the interlaced style, with radially arranged web filaments. Its geometric characters are easily

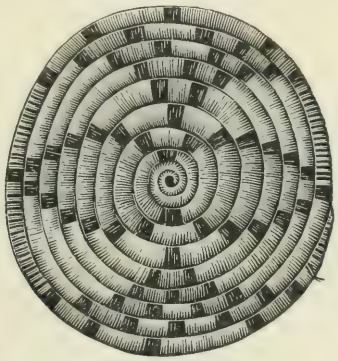

FIG. 327. Coiled tray with geometric devices, probably modified by ideographic association. Moki work — ¼.

distinguished from those of the coiled ware. Many examples exhibit purely conventional elaboration, the figures being arranged in rays,

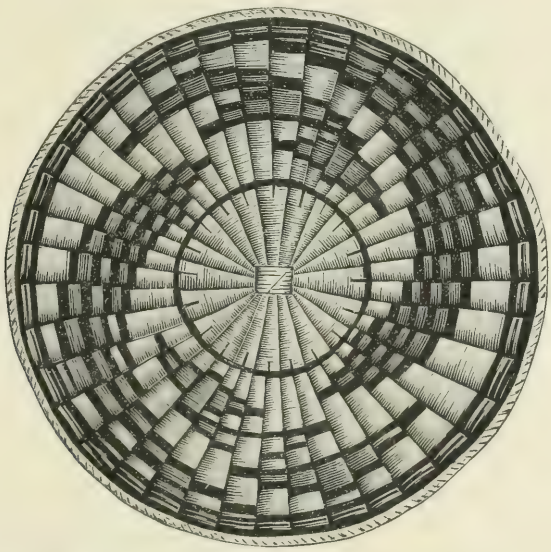

FIG. 328. Tray of interlaced style of weaving, showing geometric ornament, probably modified by ideographic association. Moki work — ¼.

zones, checkers, and the like. It is to be expected, however, that the normal ornament of this class of products should be greatly interfered with through attempts to introduce extraneous elements, for the peoples have advanced to a stage of culture at which it is usual to attempt the introduction of mythologic representations into all art. Further consideration of this subject will be necessary in the next section of this paper.

The processes of pure geometric elaboration with which this section is mainly concerned can be studied to best advantage in more primitive forms of art.

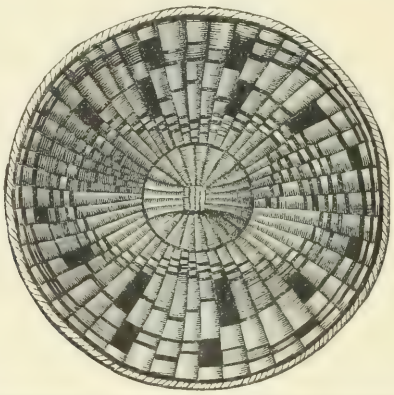

FIG. 329. Tray of interlaced style of weaving, showing geometric ornament, probably modified by ideographic association. Moki work. ½.

Non-essential constructive features.—Now, all the varied effects of color and design described in the preceding paragraphs are obtained without seriously modifying the simple necessary construction, without resorting to the multiple extraordinary devices within easy reach. The development and utilization of the latter class of resources must now receive attention. In the preceding examples, when it was desired to begin a figure in color the normal ground filament was dropped out and a colored one set into its place and made to fill its office while it remained; but we find that in many classes of work the colored elements were added to the essential parts, not substituted for them, although they are usually of use in perfecting the fabric by adding to serviceability as well as to beauty. This is illustrated, for example, by the doubling of one series or of both warp and woof, by the introduction of pile, by wrapping filaments with strands of other colors, or by twisting in feathers. Savage nations in all parts of the world are acquainted with devices of this class and employ them with great freedom. The effects produced often correspond closely to needlework, and the materials employed are often identical in both varieties of execution.

The following examples will serve to illustrate my meaning. The effect seen in Fig. 330 is observed in a small hand wallet obtained in Mexico. The fillets employed appear to be wide, flattened straws of varied colors. In order to avoid the monotony of a plain checker certain of the light fillets are wrapped with thin fillets of dark tint in such a way that when woven the dark color appears in small squares placed diagonally with the fundamental checkers. Additional effects are produced by covering certain portions of the filaments with straws of distinct color, all being woven in with the fabric. By other devices

certain parts of the fillets are made to stand out from the surface in sharp points and in ridges, forming geometric figures, either normal or added elements being employed. Another device is shown in Fig. 331. Here a pattern is secured by carrying dark fillets back and forth over the light colored fabric, catching them down at regular intervals during the process of weaving. Again, feathers and other

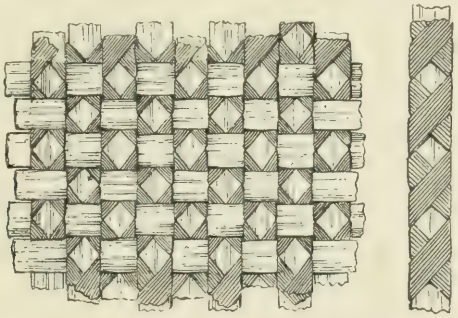

FIG. 330. Ornament produced by wrapping certain light fillets with darker ones before weaving. Mexican work.

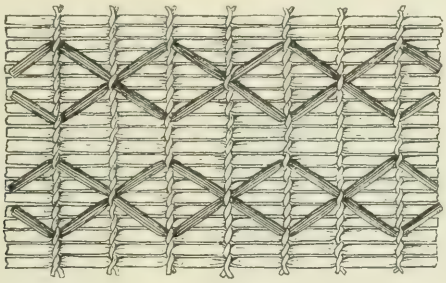

FIG. 331. Ornamental effect secured by weaving in series of dark fillets, forming a superficial device. Work of the Klamath Indians.

embellishing media are woven in with the woof. Two interesting baskets procured from the Indians of the northwest coast are shown in Figs. 332 and 333. Feathers of brilliant hues are fixed to and woven in with certain of the woof strands, which are treated, in the execution of patterns, just as are ordinary colored threads, care being taken not

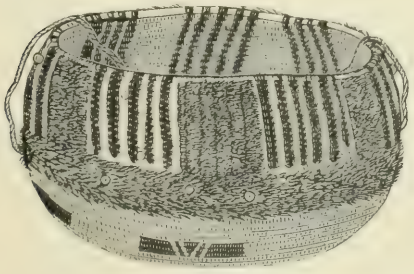

FIG. 332.

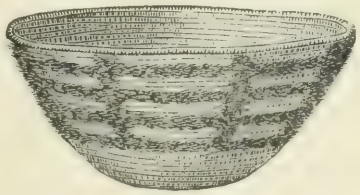

FIG. 333.

Baskets ornamented with feather work. Northwest coast tribes. ⅛.

to destroy the beauty of the feathers in the process. The richly colored feathers lying smoothly in one direction are made to represent various figures necessarily geometric. This simple work is much surpassed, however, by the marvelous feather ornamentation of the Mexicans and Peruvians, of which glowing accounts are given by historians and of which a few meager traces are found in tombs. Much of the feather work of all nations is of the nature of embroidery and will receive attention further on. A very clever device practiced by the northwest coast tribes consists in the use of two woof strands of contrasting colors, one or the other being made to appear on the surface, as the pattern demands.

An example from a higher grade of art will be of value in this connection. The ancient Peruvians resorted to many clever devices for purposes of enrichment. An illustration of the use of extra-constructional means to secure desired ends are given in Figs. 334 and 335. Threads constituting a supplemental warp and woof are carried across the under side of a common piece of fabric, that they may be brought up and woven in here and there to produce figures of contrasting color upon the right side. Fig. 334 shows the right side of the cloth, with the secondary series appearing in the border and central figure only. Fig. 335 illustrates the opposite side

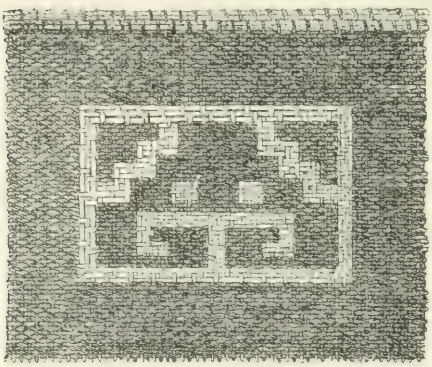

Fig. 334.

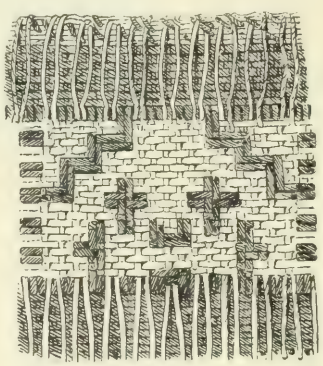

Fig. 335.

Piece of cotton cloth showing the use of a supplementary web and woof. Ancient Peru.

and shows the loose hanging, unused portions of the auxiliary series. In such work, when the figures are numerous and occupy a large part of the surface, the fabric is really a double one, having a dual warp and woof. Examples could be multiplied indefinitely, but it will readily be seen from what has been presented that the results of these extraordinary means cannot differ greatly from those legitimately produced by the fundamental filaments alone.

Superconstructive features.—In reviewing the superconstructive decorative features in the preceding section I classified them some-

what closely by method of execution or application to the fabric, as stitched, inserted, drawn, cut, applied, and appended. It will be seen that, although these devices are to a great extent of the nature of needlework, all cannot be classed under this head.

Before needles came into use the decorative features were inserted and attached in a variety of ways. In open work nothing was needed but the end of the fillet or part inserted; again, in close work, perforations were made as in leather work, and the threads were inserted as are the waxed ends of the shoemaker.

The importance of this class of decorative devices to primitive peoples will be apparent if we but call to mind the work of our own Indian tribes. What a vast deal of attention is paid to those classes of embroideries in which beads, feathers, quills, shells, seeds, teeth, &c., are employed, and to the multitude of novel applications of tassels, fringes, and tinkling pendants. The taste for these things is universal and their relation to the development of esthetic ideas is doubtless very intimate.

Needlework arose in the earliest stages of art and at first was employed in joining parts, such as leaves, skins, and tissues, for various useful purposes, and afterwards in attaching ornaments. In time the attaching media, as exposed in stitches, loops, knots, and the like, being of bright colors, were themselves utilized as embellishment, and margins and apertures were beautified by various bindings and borders, and finally patterns were worked in contrasting colors upon the surfaces of the cloths and other materials of like nature or use.

No other art so constantly and decidedly suggested embellishment and called for the exercise of taste. It was the natural habitat for decoration. It was the field in which technique and taste were most frequently called upon to work hand in hand.

With the growth of culture the art was expanded and perfected, its wonderful capacity for expression leading from mere bindings to pretentious borders, to patterns, to the introduction of ideographs, to the representation of symbols and mythologic subjects, and from these to the delineation of nature, the presentation of historical and purely pictorial scenes.

And now a few words in regard to the character of the work and its bearing upon the geometric system of decoration. As purely constructive ornamentation has already been presented, I will first take up that class of superconstructive work most nearly related to it. In some varieties of basketry certain bindings of the warp and woof are actually left imperfect, with the idea of completing the construction by subsequent processes, the intersections being gone over stitch by stitch and lashed together, the embroidery threads passing in regular order through the openings of the mesh. This process is extremely convenient to the decorator, as changes from one color to another are made without interfering with construction, and the result is of a

closely similar character to that reached by working the colors in with warp and woof. In a very close fabric this method cannot be employed, but like results are reached by passing the added filaments beneath the protruding parts of the bindings and, stitch by stitch, covering up the plain fabric, working bright patterns. Fig. 336 is intended to show how this is done. The foundation is of twined work

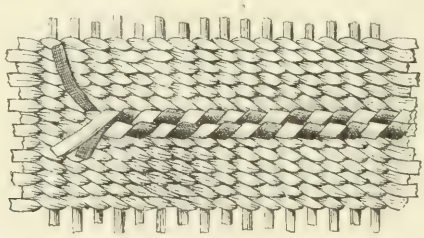

FIG. 336. Grass embroidery upon the surface of closely impacted, twined basketry. Work of the northwest coast Indians.

and the decorating fillets are passed under by lifting, with or without a needle. This process is extensively practiced by our west coast tribes, and the results are extremely pleasing. The materials most used are quills and bright colored straws, the foundation fabric being of bark or of rushes. The results in such work are generally geometric, in a way corresponding more or less closely with the ground work combination.

A large class of embroideries are applied by like processes, but without reference to the construction of the foundation fabric, as they are also applied to felt and leather. Again, artificially prepared perforations are used, through which the fillets are passed. The results are much less uniformly geometric than where the fabric is followed; yet the mere adding of the figures, stitch by stitch or part by part, is sufficient to impart a large share of geometricity, as may be seen in the buckskin bead work and in the dentalium and quill work of the Indians.

Feather embroidery was carried to a high degree of perfection by our ancient aborigines, and the results were perhaps the most brilliant of all these wonderful decorations. I have already shown how feathers are woven in with the warp and woof, and may now give a single illustration of the application of feather work to the surfaces of fabrics. Among the beautiful articles recovered from the tombs of Ancon, Peru, are some much decayed specimens of feather work. In our example delicate feathers of red, blue, and yellow hues are applied to the surface of a coarse cotton fabric by first carefully tying them together in rows at regular distances and afterwards stitching them down, as shown in Fig. 337.

The same method is practiced by modern peoples in many parts of the world. Other decorative materials are applied in similar ways by attachment to cords or fillets which are afterwards stitched down. In all this work the geometricity is entirely or nearly uniform with

that of the foundation fabrics. Other classes of decoration, drawn work, appliqué, and the like, are not of great importance in aboriginal art and need no additional attention here, as they have but slight bearing upon the development of design.

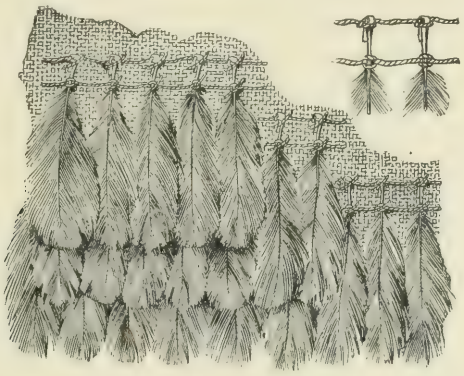

FIG. 337. Feather embroidery of the ancient Peruvians, showing the method of attaching the feathers

Attached or appended ornaments constitute a most important part of decorative resource. They are less subject to the laws of geometricity, being fixed to surfaces and margins without close reference to the web and woof. They include fringes, tassels, and the multitude of appendable objects, natural and artificial, with which primitive races bedeck their garments and utensils. A somewhat detailed study of this class of ornament is given at the end of the preceding section.

Adventitious features.—Ornament is applied to the surfaces of fabrics by painting and by stamping. These methods of decoration were employed in very early times and probably originated in other branches of art. If the surface features of the textile upon which a design is painted are strongly pronounced, the figures produced with the brush or pencil will tend to follow them, giving a decidedly geometric result. If the surface is smooth the hand is free to follow its natural tendencies, and the results will be analogous in character to designs painted upon pottery, rocks, or skins. In primitive times both the texture of the textiles and the habits of the decorator, acquired in textile work, tended towards the geometric style of delineation, and we find that in work in which the fabric lines are not followed at all the designs are still geometric, and geometric in the same way as are similar designs woven in with the fabric. Illustrations of this are given in the next section.

I have dwelt at sufficient length upon the character and the tendencies of the peculiar system of embellishment that arises within textile art as the necessary outgrowth of technique, and now proceed to explain the relations of this system to associated art.

In the strong forward tendency of the textile system of decoration it has made two conquests of especial importance. In the first place it has subdued and assimilated all those elements of ornament that have happened to enter its realm from without, and in the second place it has imposed its habits and customs upon the decorative systems of all arts with which the textile art has come in contact.

GEOMETRICITY IMPOSED UPON ADOPTED ELEMENTS OF DESIGN.

At a very early stage of culture most peoples manifest decided artistic tendencies, which are revealed in attempts to depict various devices, life forms, and fancies upon the skin and upon the surfaces of utensils, garments, and other articles and objects. The figures are very often decorative in effect and may be of a trivial nature, but very generally such art is serious and pertains to events or superstitions. The devices employed may be purely conventional or geometric, containing no graphic element whatever; but life forms afford the most natural and satisfactory means of recording, conveying, and symbolizing ideas, and hence preponderate largely. Such forms, on account of their intimate relations with the philosophy of the people, are freely embodied in every art suitable to their employment. As already seen, the peculiar character of textile construction places great difficulties in the way of introducing unsymmetric and complex figures like those of natural objects into fabrics. The idea of so employing them may originally have been suggested by the application of designs in color to the woven surfaces or by resemblances between the simpler conventional life form derivatives and the geometric figures indigenous to the art.

At any rate, the idea of introducing life forms into the texture was suggested, and in the course of time a great deal of skill was shown in their delineation, the bolder workmen venturing to employ a wide range of graphic subjects.

Now, if we examine these woven forms with reference to the modifications brought about by the textile surveillance, we find that the figures, as introduced in the cloth, do not at all correspond with those executed by ordinary graphic methods, either in degree of elaboration or in truthfulness of expression. They have a style of their own. Each delineative element upon entering the textile realm is forced into those peculiar conventional outlines imposed by the geometric construction, the character of which has already been dwelt upon at considerable length. We find, however, that the degree of convention is not uniform throughout all fabrics, but that it varies with the refinement of the threads or filaments, the compactness of the mesh, the character of the combination, the graphic skill of the artist, and the tendencies of his mind; yet we observe that through all there is still exhibited a distinct and peculiar geometricity.

So pronounced is this technical bias that delineations of a particular

creature — as, for example, a bird — executed by distant and unrelated peoples, are reduced in corresponding styles of fabric to almost identical shapes. This conventionalizing force is further illustrated by the tendency in textile representation to blot out differences of time and culture, so that when a civilized artisan, capable of realistic pictorial delineation of a high order, introduces a figure into a certain form of coarse fabric he arrives at a result almost identical with that reached by the savage using the same, who has no graphic language beyond the rudest outline.

A number of examples may be given illustrating this remarkable power of textile combination over ornament. I select three in which the human figure is presented. One is chosen from Iroquoian art, one from Digger Indian art, and one from the art of the Incas — peoples unequal in grade of culture, isolated geographically, and racially distinct. I have selected specimens in which the parts employed give features of corresponding size, so that comparisons are easily instituted. The example shown in Fig. 338 illustrates a construction peculiar to the wampum belts of the Iroquois and their neighbors, and quite unlike ordinary weaving. It is taken from the middle portion of what is known as the Penn wampum belt. The horizontal series of strands consists of narrow strips of buckskin, through which the opposing series of threads are sewed, holding in place the rows of cylin-

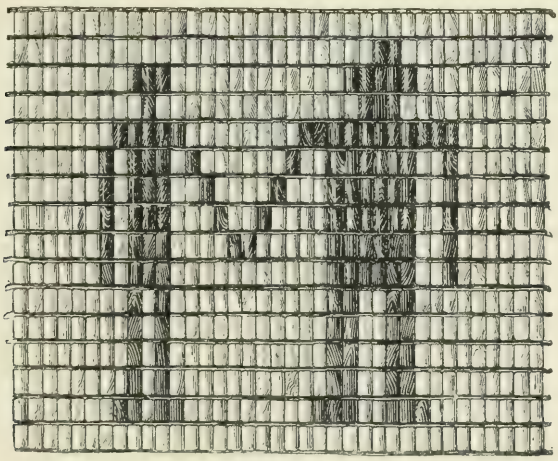

FIG. 338. Figures from the Penn wampum belt, showing the conventional form imposed in bead work.

drical shell beads. Purple beads are employed to develop the figures in a ground of white beads. If the maker of this belt had been required to execute in chalk a drawing depicting brotherly love the results would have been very different.

My second illustration (Fig. 339) is drawn from a superb example of the basketry of the Yokut Indians of California. The two figures form

part of a spirally radiating band of ornament, which is shown to good advantage in the small cut, Fig. 340. It is of the coiled style of construction. The design is worked in four colors and the effect is quiet and rich.

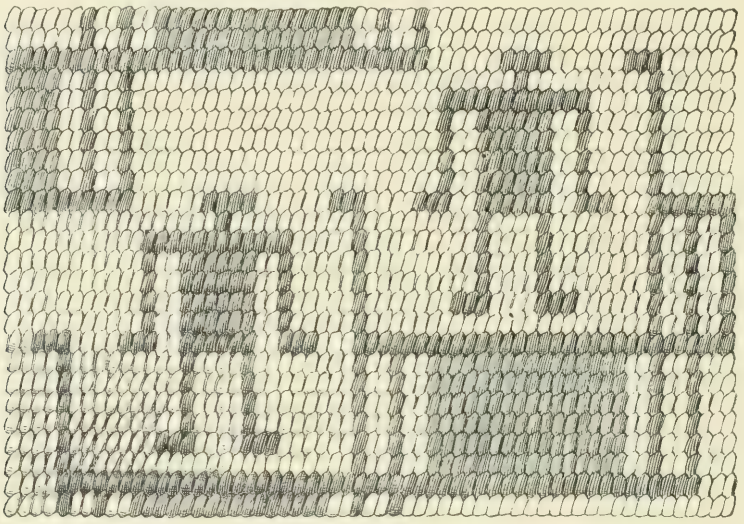

FIG. 339. Conventional figures from a California Indian basket.

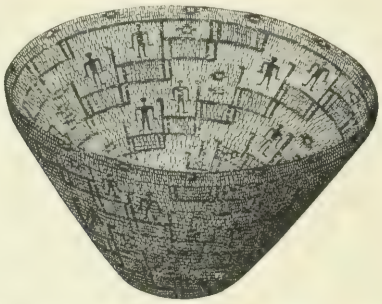

FIG. 340. Basket made by the Yokut Indians of California.

Turning southward from California and passing through many strange lands we find ourselves in Peru, and among a class of remains that bespeak a high grade of culture. The inhabitants of Ancon were wonderfully skilled in the textile art, and thousands of handsome examples have been obtained from their ancient tombs. Among these relics are many neat little workbaskets woven from rushes. One of these, now in the National Museum, is encircled by a decorated belt in which are represented seven human figures woven in black filaments upon a brown ground.

The base and rim of the basket are woven in the intertwined combination, but in the decorated belt the style is changed to the plain

right angled interlacing, for the reason, no doubt, that this combination was better suited to the development of the intended design. Besides the fundamental series of fillets the weaver resorted to unusual devices in order to secure certain desired results. In the first place the black horizontal series of filaments does not alternate in the simplest way with the brown series, but, where a wide space of the dark color is called for, several of the brown strands are passed over at one step, as in the head and body, and in the wider interspaces the dark strands pass under two or more of the opposing strands. In this way broad areas of color are obtained. It will be observed, however, that the construction is weakened by this modification, and that to remedy the defect two additional extra constructive series of fillets are added. These are of much lighter weight

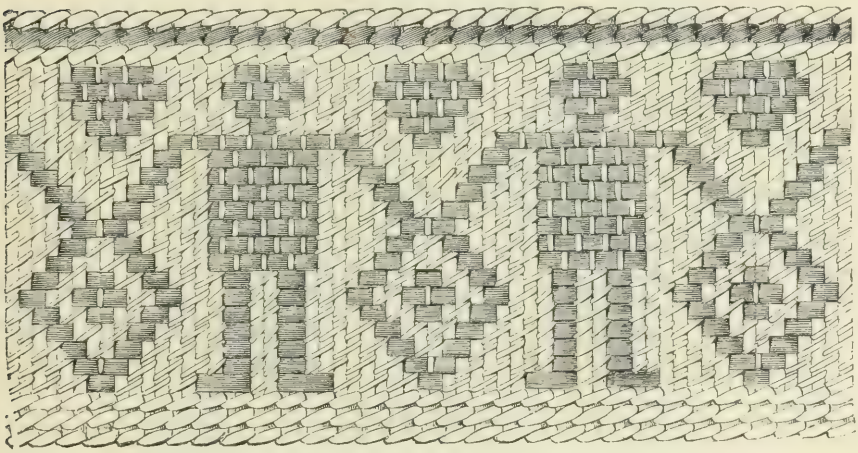

FIG. 341. Conventional human figures from an ancient Peruvian basket.

than the main series, that they may not obscure the pattern. Over the dark series they run vertically and over the light obliquely.

It will be seen that the result, notwithstanding all this modification of procedure, is still remarkably like that of the preceding examples, the figures corresponding closely in kind and degree of geometricity.

The fact is that in this coarse work refinement of drawing is absolutely unattainable. It appears that the sharply pronounced steps exhibited in the outlines are due to the great width of the fillets used. With the finer threads employed by most nations of moderate culture the stepped effect need not obtrude itself, for smooth outlines and graceful curves are easily attainable; yet, as a rule, even the finer fabrics continue to exhibit in their decorations the pronounced geometric character seen in ruder forms. I present a striking example of this in Fig. 342, a superb piece of Incarian gobelins, in which a gaily costumed personage is worked upon a dark red ground dot-

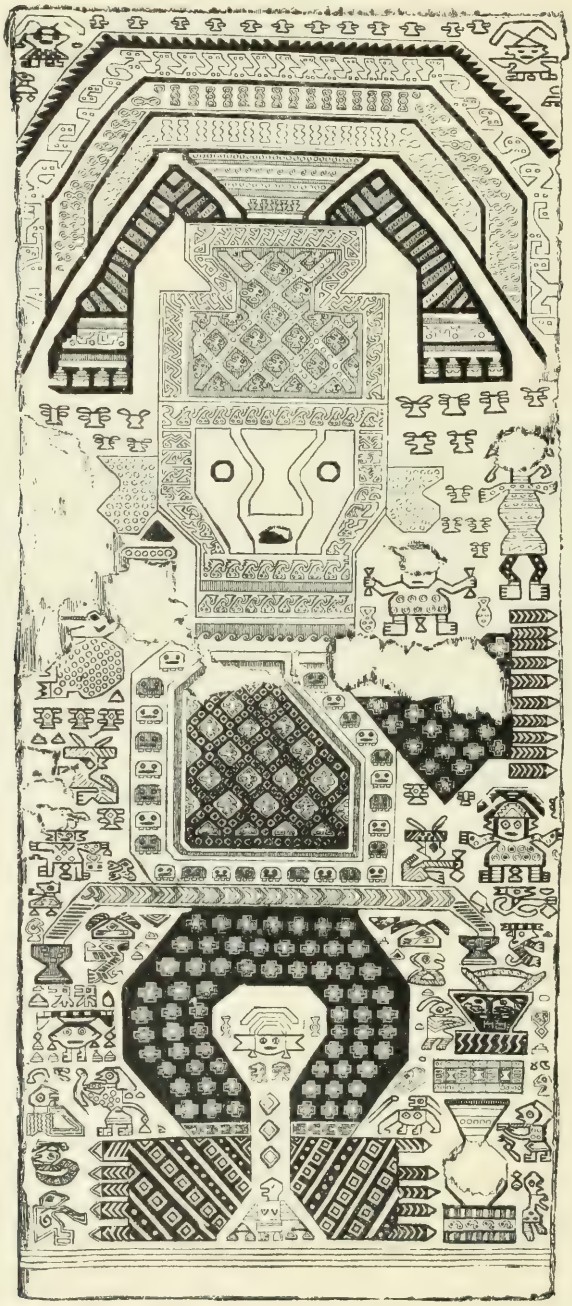

FIG. 342. Human figure in Peruvian gobelins, showing characteristic textile convention. From chromolithographs published by Reiss and Stübel in The Necropolis of Ancon.

ted with symbols and strange devices. The work is executed in brilliant colors and in great detail. But with all the facility afforded for the expression of minutely modulated form the straight lines and sharp angles are still present. The traditions of the art were favorable to great geometricity, and the tendencies of the warp and woof and the shape of the spaces to be filled were decidedly in that direction.

FIG. 343. Human figures from a Peruvian vase, done in free hand, graphic style.

In order that the full force of my remarks may be appreciable to to the eye of the reader, I give an additional illustration (Fig. 343). The two figures here shown, although I am not able to say positively that the work is pre-Columbian, were executed by a native artist of about the same stage of culture as was the work of the textile design. These figures are executed in color upon the smooth surface of an earthen vase and illustrate perfectly the peculiar characters of free hand, graphic delineation. Place this and the last figure side by side and we see how vastly different is the work of two artists of equal capacity when executed in the two methods. This figure should also be compared with the embroidered figures shown in Fig. 348.

The tendencies to uniformity in textile ornament here illustrated may be observed the world over. Every element entering the art must undergo a similar metamorphosis; hence the remarkable power

of this almost universally practiced art upon the whole body of decorative design.

That the range of results produced by varying styles of weaving and of woven objects may be appreciated, I present some additional examples. Coiled wares, for instance, present decorative phenomena strikingly at variance with those in which there is a rectangular disposition of parts. Instead of the two or more interlacing series of parallel fillets exhibited in the latter style, we have one radiate and one concentric series. The effect of this arrangement upon the

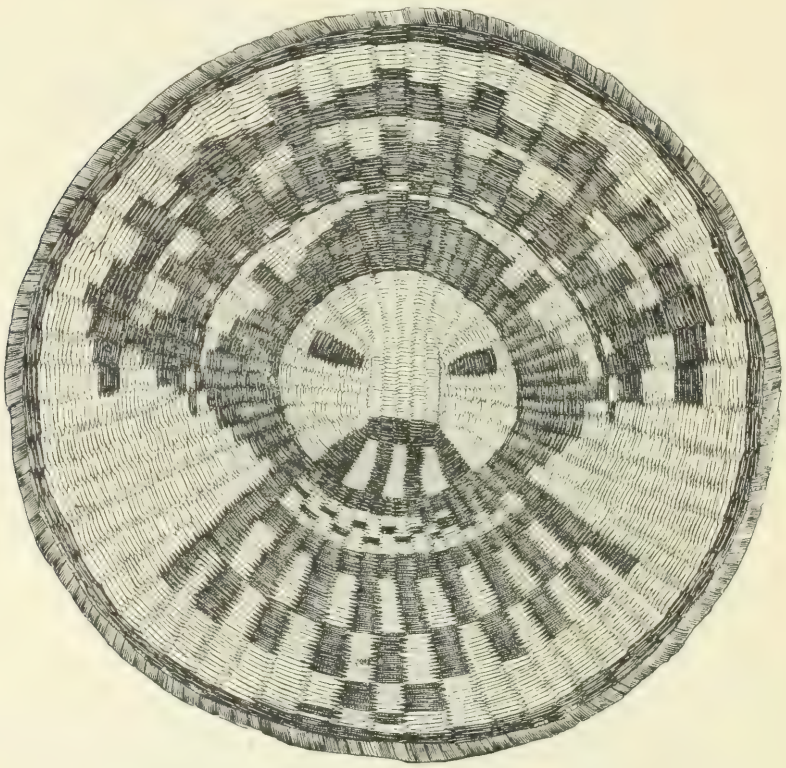

FIG. 344. Human figure modified by execution in concentric interlaced style of weaving — ½.

introduced human figure is very striking, as will be seen by reference to Fig. 344, which represents a large tray obtained from the Moki Indians. The figure probably represents one of the mythologic personages of the Moki pantheon or some otherwise important priestly functionary, wearing the characteristic headdress of the ceremony in which the plaque was to be used. The work is executed in wicker, stained in such bright tints as were considered appropriate to the various features of the costume. Referring in detail to the shape and arrangement of the parts of the figure, it is apparent that many

of the remarkable features are due to constructive peculiarities. The round face, for example, does not refer to the sun or the moon, but results from the concentric weaving. The oblique eyes have no reference to a Mongolian origin, as they only follow the direction of the ray upon which they are woven, and the headdress does not refer to the rainbow or the aurora because it is arched, but is arched because the construction forced it into this shape. The proportion of the figure is not so very bad because the Moki artist did not know better, but because the surface of the tray did not afford room to project the body and limbs

FIG. 345. Figure of a bird painted upon a Zuñi shield, free hand delineation.

Now, it may be further observed that had the figure been placed at one side of the center, extending only from the border to the middle of the tray, an entirely different result would have been reached; but this is better illustrated in a series of bird delineations presented in the following figures. With many tribes the bird is an object of superstitious interest and is introduced freely into all art products suitable for its delineation. It is drawn upon walls, skins, pottery, and various utensils and weapons, especially those directly connected with ceremonies in which the mythical bird is an important factor. The bird form was probably in familiar use long before it was employed in the decoration of basketry. In Fig. 345 I present an ordi-

nary graphic representation. It is copied from a Zuñi shield and is the device of an order or the totem of a clan. The style is quite conventional, as a result of the various constraints surrounding its production. But what a strange metamorphosis takes place when it is presented in the basketmaker's language. Observe the conventional pattern shown upon the surface of a Moki tray (Fig. 346). We have difficulty in recognizing the bird at all, although the conception is identical with the preceding. The positions of the head and legs and

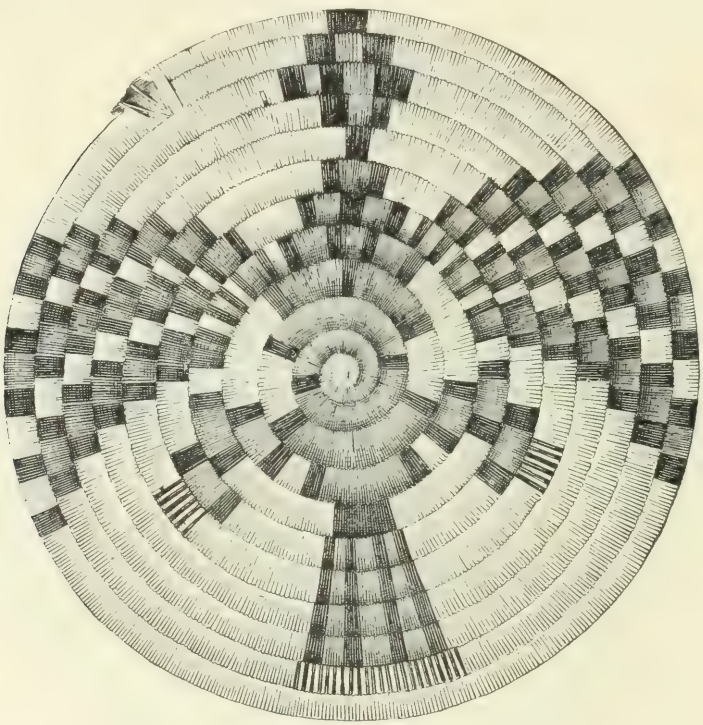

FIG. 346. Figure of a bird executed in a coiled Moki tray, textile delineation.

the expanded wings and tail correspond as closely as possible, but delineation is hampered by technique. The peculiar construction barely permits the presentation of a recognizable life form, and permits it in a particular way, which will be understood by a comparison with the treatment of the human figure in Fig. 344. In that case the interlaced combination gives relievo results, characterized by wide, radiating ribs and narrow, inconspicuous, concentric lines, which cross the ribs in long steps. The power of expression lies almost wholly with the concentric series, and detail must in a great measure follow the concentric lines. In the present case (Fig. 346) this is reversed and lines employed in expressing forms are radiate.

The precise effect of this difference of construction upon a particu-

lar feature may be shown by the introduction of another illustration. In Fig. 347 we have a bird woven in a basket of the interlaced style. We see with what ease the long sharp bill and the slender tongue (shown by a red filament between the two dark mandibles) are expressed. In the other case the construction is such that the bill, if extended in the normal direction, is broad and square at the end, and the tongue, instead of lying between the mandibles, must run across the bill, totally at variance with the truth; in this case the tongue is so represented, the light vertical band seen in the cut being a yellow stripe. It will be seen that the two representations are very unlike each other, not because of differences in the conception and not wholly on account of the style of weaving, but rather because the artist chose to extend one across the whole surface of the utensil and to confine the other to one side of the center.

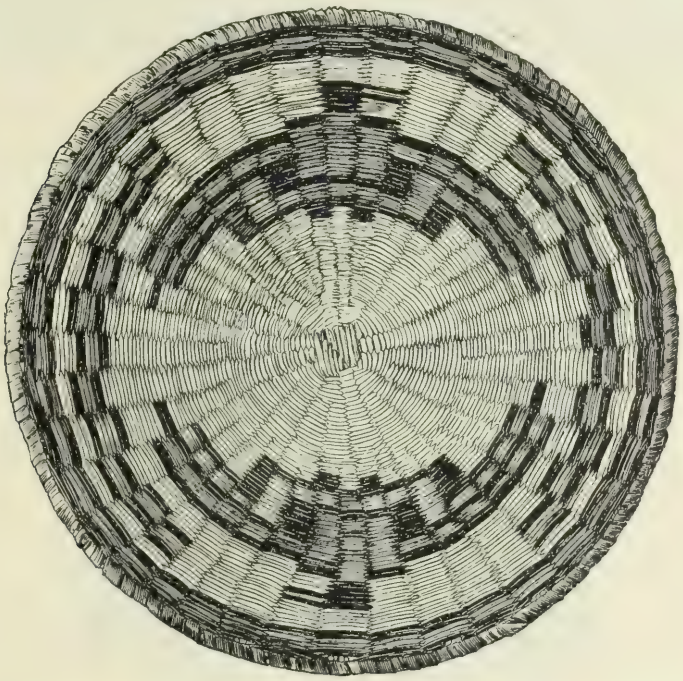

FIG. 347. Figure of a bird woven in interlaced wicker at one side of the center.

It is clear, therefore, from the preceding observations that the convention of woven life forms varies with the kind of weaving, with the shape of the object, with the position upon the object, and with the shape of the space occupied, as well as with the inherited style of treatment and with the capacity of the artist concerned. These varied forces and influences unite in the metamorphosis of all the incoming elements of textile embellishment.

It will be of interest to examine somewhat closely the modifications

produced in pictorial motives introduced through superstructural and adventitious agencies.

We are accustomed, at this age of the world, to see needlework employed successfully in the delineation of graphic forms and observe that even the Indian, under the tutelage of the European, reproduces in a more or less realistic way the forms of vegetal and animal life. As a result we find it difficult to realize the simplicity and conservatism of primitive art. The intention of the primitive artist was generally not to depict nature, but to express an idea or decorate a space, and there was no strong reason why the figures should not submit to the conventionalizing tendencies of the art.

I have already shown that embroidered designs, although not from necessity confined to geometric outlines, tend to take a purely geometric character from the fabric upon which they are executed, as well as from the mechanical processes of stitching. This is well shown in Fig. 348, a fine specimen given by Wiener in his work Pérou et Bolive.

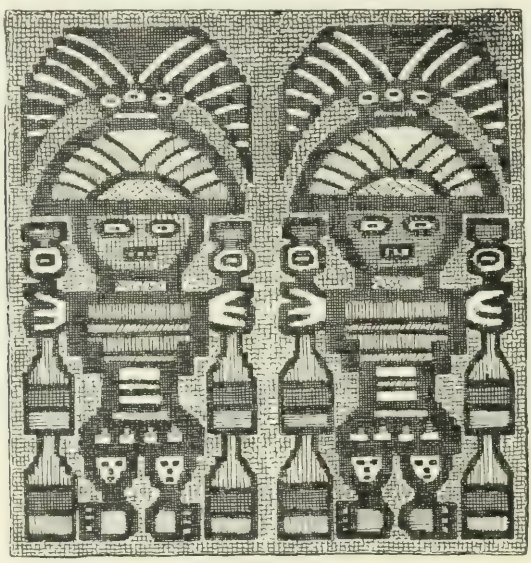

FIG. 348. Embroidery upon a cotton net in which the textile combinations are followed step by step. Ancient Peruvian work.

A life form worked upon a net does not differ essentially from the same subject woven in with the web and woof. The reason is found in the fact that in embroidery the workman was accustomed from the first to follow the geometric combination of the foundation fabric step by step, and later in life delination he pursued the same method.

It would seem natural, however, that when the foundation fabric does not exhibit well marked geometric characters, as in compactly woven canvas, the needlework would assume free hand characters

and follow the curves and irregularities of the natural object depicted; but such is not the case in purely aboriginal work. An example of embroidery obtained from an ancient grave at Ancon, Peru, is shown in Fig. 349. A piece of brown cotton canvas is embellished with a

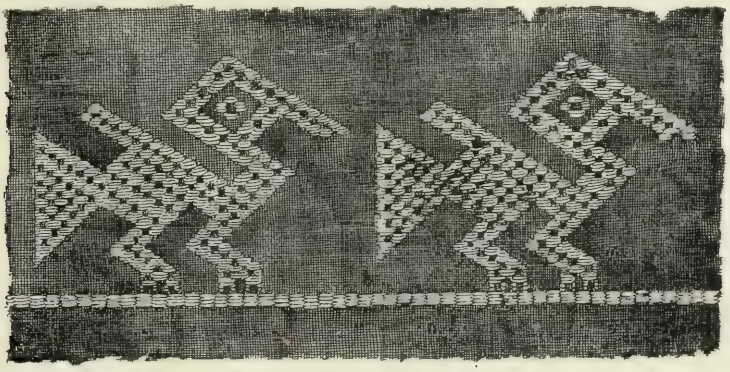

FIG. 349. Embroidery in which the foundation fabric is not followed accurately, but which exhibits the full textile geometricity. Ancient Peruvian work.

border of bird figures in bright colored wool thread. The lines of the figures do not obey the web and woof strictly, as the lines are diffi-

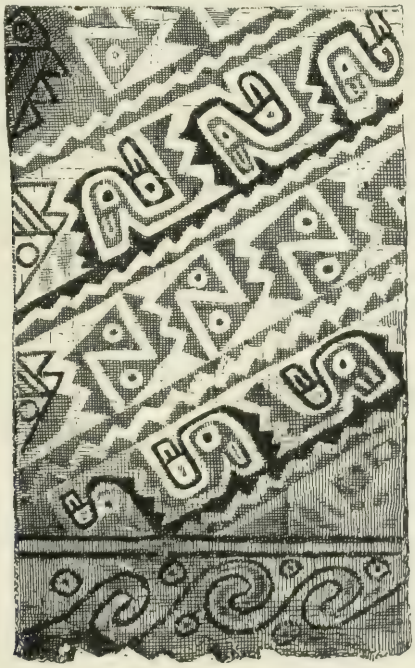

FIG. 350. Design painted in color upon a woven surface, exhibiting the full degree of geometric convention. Ancient Peruvian work. Copied from The Necropolis of Ancon.

cult to follow, but the geometric character is as perfectly preserved as if the design were woven in the goods.

So habit and association carry the geometric system into adventitious decoration. When the ancient Peruvian executed a design in color upon a woven surface (Fig. 350), using a pencil or brush, the result was hardly less subject to textile restraint.

As a matter of course, since there are two distinct styles of decorative design—the textile and the free hand—there exist intermediate forms partaking of the character of both; but it is nevertheless clear that the textile system transforms or greatly modifies all nature motives associated with it, whether introduced into the fabric or applied to its surface.

In countries where the textile art is unimportant and the textile system of decoration does not obtrude itself, free hand methods may prevail to such an extent that the geometric influence is but little felt. The Haidah Indians, for example, paint designs with great freedom and skill, and those applied to woven surfaces are identical with those executed upon skins, wood, and stone, but this art is doubtless much modified by the means and methods of Europeans. Our studies should be confined wholly to pure indigenous art.

EXTENSION OF TEXTILE ORNAMENT TO OTHER FORMS OF ART.

I have now dwelt at sufficient length upon the character of the textile system of ornament and have laid especial stress upon the manner in which it is interwoven with the technical constitution of the art. I have illustrated the remarkable power of the art by which decorative elements from without, coming once within the magic influence, are seized upon and remodeled in accordance with the laws of textile combination. Pursuing the investigation still further it is found that the dominion of the textile system is not limited to the art, but extends to other arts. Like a strong race of men it is not to be confined to its own original habitat, but spreads to other realms, stamping its own habits and character upon whatever happens to come within its reach. Its influence is felt throughout the whole range of those arts with which the esthetic sense of man seeks to associate ideas of beauty. It is necessary, before closing this paper, to examine briefly the character and extent of this influence and to describe in some detail the agencies through which the results are accomplished. First and most important are the results of direct transmission.

House building, or architecture as it is called in the higher stages, is in primitive times to a great extent textile; as culture develops, other materials and other systems of construction are employed, and the resultant forms vary accordingly; but textile characters are especially strong and persistent in the matter of ornament, and survive all changes, howsoever complete. In a similar way other branches of art differentiated in material and function from the parent art in-

herit many characters of form and ornament conceived in the textile stage. It may be difficult to say with reference to any particular example of design that it had a textile origin, for there may be multiple origins to the same or to closely corresponding forms; but we may assert in a general way of the great body of geometric ornament that it owes something—if not its inspiration, its modes of expression—to the teachings of the textile system. This appears reasonable when we consider that the weaver's art, as a medium of esthetic ideas, had precedence in time over nearly all competitors. Being first in the field it stood ready on the birth of new forms of art, whether directly related or not, to impose its characters upon them. What claim can architecture, sculpture, or ceramics have upon the decorative conceptions of the Digger Indians, or even upon those of the Zuñi or Moki? The former have no architecture, sculpture, or ceramics; but their system of decoration, as we have seen, is highly developed. The Pueblo tribes at their best have barely reached the stage at which esthetic ideas are associated with building; yet classic art has not produced a set of geometric motives more chaste or varied. These examples of the development of high forms of decoration during the very early stages of the arts are not isolated. Others are observed in other countries, and it is probable that if we could lift the veil and peer into the far prehistoric stages of the world's greatest cultures the same condition and order would be revealed. It is no doubt true that all of the shaping arts in the fullness of their development have given rise to decorative features peculiar to themselves; for construction, whether in stone, clay, wood, or metal, in their rigid conditions, exhibits characters unknown before, many of which tend to give rise to ornament. But this ornament is generally only applicable to the art in which it develops, and is not transferable by natural processes—as of a parent to its offspring—as are the esthetic features of the weaver's art.

Besides the direct transmission of characters and forms as suggested in a preceding paragraph, there are many less direct but still efficacious methods of transfer by means of which various arts acquire textile decorative features, as will be seen by the following illustrations.

Japanese art is celebrated for its exquisite decorative design. Upon superb works of porcelain we have skillful representations of subjects taken from nature and from mythology, which are set with perfect taste upon fields or within borders of elaborate geometric design. If we should ask how such motives came to be employed in ceramic decoration, the answer would be given that they were selected and employed because they were regarded as fitting and beautiful by a race of decorators whose taste is well nigh infallible. But this explanation, however satisfactory as applied to individual examples of modern art, is not at all applicable to primitive art, for the mind of

man was not primarily conscious of the beauty or fitness of decorative elements, nor did he think of using them independently of the art to which they were indigenous. Now the ceramic art gives rise to comparatively few elements of decoration, and must therefore acquire the great body of its decorative motives from other arts by some process not primarily dependent upon the exercise of judgment or taste, and yet not by direct inheritance, as the techniques of the two arts are wholly distinct.

Textile and fictile arts are, in their earlier stages, to a large extent, vessel making arts, the one being functionally the offshoot of the other. The textile art is the parent, and, as I have already shown, develops within itself a geometric system of ornament. The fictile art is the offshoot and has within itself no predilection for decoration. It is dependent and plastic. Its forms are to a great extent modeled and molded within the textile shapes and acquire automatically some of the decorative surface characters of the mold. This is the beginning of the transfer, and as time goes on other methods are suggested by which elements indigenous to the one art are transferred to the other. Thus we explain the occurrence, the constant recurrence of certain primary decorative motives in primitive ceramics. The herring bone, the checker, the guilloche, and the like are greatly the heritage of the textile art. Two forms derived from textile surfaces are illustrated in Figs. 351 and 352. In the

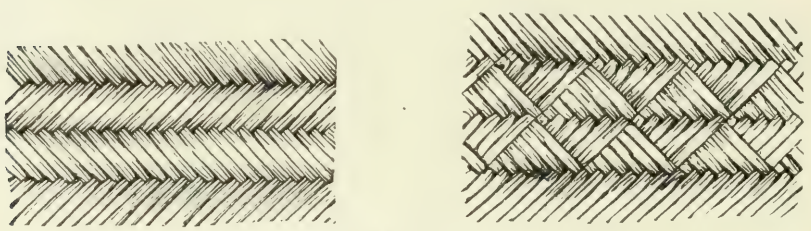

FIG. 351. Herring bone and checker patterns produced in textile combinations.

FIG. 352. Herring bone and checker figures in fictile forms transferred from the textile.

first example shown, herring bone patterns appear as the result of textile combination, and in the second a triangular checker is produced in the same way. In Fig. 352 we see the result of copying these patterns in incised lines upon soft clay.

Again, the ancient potter, who was in the habit of modeling his

wares within baskets, seems to have conceived the idea of building his vessels by coiling just as he built his baskets. The surface exhibits coiled ridges like basketry, as shown in Fig. 353, and the

FIG. 353. Earthen vase built by coiling, exhibiting decorative characters derived from basketry.

textile character was further imposed upon the clay by marking these coils with the thumb and with implements to give the effect of the transverse series of filaments, and the geometric color patterns of the basketry were reproduced in incised lines. When these peoples came to paint their wares it was natural that the colored patterns native to the basketry should also be reproduced, and many more or less literal transfers by copying are to be found. A fine example of these painted textile designs is shown in Fig. 354. It is executed in a masterly style upon a handsome vase of the white ware of ancient Tusayan. Not only are the details reproduced with all their geometric exactness, but the arrangement of the designs upon the vessel is the same as in the textile original. Nine-tenths of the more archaic, Pueblo, ceramic, ornamental designs are traceable to the textile art, and all show the influence of textile convention.

Another peculiar class of transfers of a somewhat more indirect nature may be noticed. All the more advanced American nations were very fond of modeling the human form in clay, a large per-

FIG. 354. Ceramic ornament copied literally from a textile original.

centage of vessels having some trace of the human form or physiognomy. Now, in many cases the costume of the personage represented in the clay is also imitated, and generally in color, the details of the fabrics receiving their full share of attention. Such an example, from a sepulcher at Ancon, is shown in Fig. 355. Here the poncho

FIG. 355. Textile patterns transferred to pottery through the copying of costume. From The Necropolis of Ancon, by Reiss and Stübel, Pl. 94.

or mantle thrown across the shoulders falls down upon the body in front and behind and the stripes and conventional fishes are accurately reproduced. In this way both style and matter of the textile decoration are introduced into the ceramic art.

It will be seen by these illustrations that there are many natural

methods, automatic or semiautomatic in character, by which the one art receives aid from the other; that in the beginning of the transfer of textile ornament to fictile forms the process is purely mechanical, and that it is continued automatically without any very decided exercise of judgment or taste. As a result, these borrowed decorations are generally quite as consistent and appropriate as if developed within the art itself. Later in the course of progress the potter escapes in a measure from this narrow groove and elaborates his designs with more freedom, being governed still to a certain extent by the laws of instinctive and automatic procedure. When, finally, intellect assumes to carry on the work independently of these laws, decoration tends to become debased.

Turning to other branches of art, what traces do we find of the transfer to them of textile features? Take, for example, sculpture. In the wood carving of the Polynesians we observe a most elaborate system of decoration, more or less geometric in character. We do not need to look a second time to discover a striking likeness to the textile system, and we ask, Is it also derived from a textile source? In the first place let us seek within the art a reason for the peculiar forms. In carving wood and in tracing figures upon it with pointed tools the tendency would certainly be towards straight lines and formal combinations; but in this work there would be a lack of uniformity in execution and of persistency in narrow lines of combination, such as result from the constant necessity of counting and spacing in the textile art. In the presentation of natural forms curved lines are called for, and there is nothing inherent in the carver's art to forbid the turning of such lines with the graver or knife. Graphic art would be realistic to an extent regulated by the skill and habits of the artist. But, in reality, the geometric character of this work is very pronounced, and we turn naturally toward the textile art to ask whether in some way that art has not exercised an influence. The textile arts of these peoples are highly developed and were doubtless so in a degree from very early times, and must have had a close relation with the various arts, and especially so in the matter of ornament. Specific examples may be cited showing the intimacy of wood carving to textilia. Bows, spears, arrows, &c. are bound with textile materials to increase their strength. Knives and other weapons are covered with textile sheaths and handles of certain utensils are lashed on with twisted cords. In ceremonial objects these textile features are elaborated for ornament and the characteristic features of this ornament are transferred to associated surfaces of wood and stone by the graver. A most instructive illustration is seen in the ceremonial adzes so numerous in museums (Fig. 356). The cords used primarily in attaching the haft are, after loss of function, elaborately plaited and interwoven until they become an important feature and assume the character of decoration. The heavy wooden

handles are elaborately carved, and the suggestions of figures given by the interlaced cords are carried out in such detail that at a little distance it is impossible to say where the real textile surface ceases and the sculptured portion begins.

All things considered, I regard it as highly probable that much of the geometric character exhibited in Polynesian decoration is due to textile dominance. That these peoples are in the habit of employing

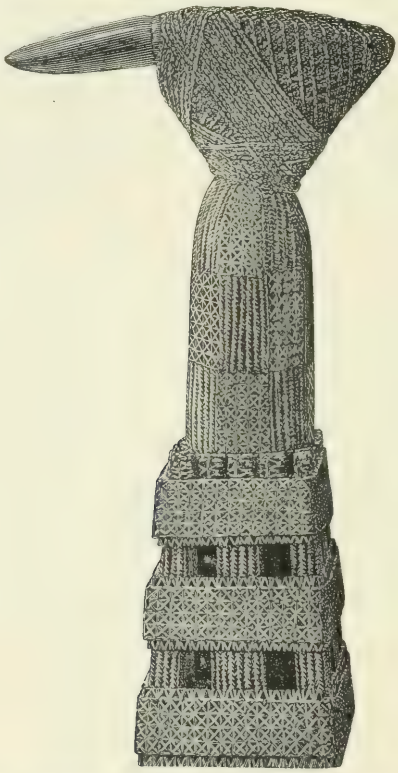

FIG. 356. Ceremonial adz, with carved ornament imitating textile wrapping. Polynesian work

textile designs in non-textile arts is shown in articles of costume, such as the tapa cloths, made from the bark of the mulberry tree, which are painted or stamped in elaborate geometric patterns. This transfer is also a perfectly natural one, as the ornament is applied to articles having functions identical with the woven stuffs in which the patterns originate, and, besides, the transfer is accomplished by means of stamps themselves textile. Fig. 357 illustrates the construction of these stamps and indicates just how the textile character is acquired.

Textile materials are very generally associated with the human figure in art, and thus sculpture, which deals chiefly with the human form, becomes familiar with geometric motives and acquires them. Through sculpture these motives enter architecture. But textile

decoration pervades architecture before the sculptor's chisel begins to carve ornament in stone and before architecture has developed of itself the rudiments of a system of surface embellishment. Textile

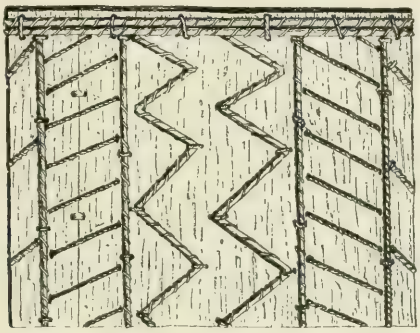

FIG. 357. Portion of a tapa stamp, showing its subtextile character. A palm leaf is cut to the desired shape and the patterns are sewed in or stitched on.

art in mats, covers, shelters, and draperies is intimately associated with floors and walls of houses, and the textile devices are in time transferred to the stone and plaster. The wall of an ancient Pueblo estufa, or ceremonial chamber, built in the pre-esthetic period of architecture, antedating, in stage of culture, the first known step in Egyptian art, is encircled by a band of painted figures, borrowed, like those of the pottery, from a textile source. The doorway or rather entrance to the rude hovel of a Navajo Indian is closed by a blanket of native make, unsurpassed in execution and exhibiting conventional designs of a high order.

FIG. 358. Design in stucco, exhibiting textile characters.

The ancient "hall of the arabesques" at Chimu, Peru, is decorated in elaborate designs that could only have arisen in the textile art

(Fig. 358), and other equally striking examples are to be found in other American countries. The classic surface decorations known and used in Oriental countries from time immemorial prevailed in indigenous American architecture at a stage of culture lower than any known stage of classic art.

It may appear that I have advocated too strongly the claims of the textile art to the parentage of geometric ornament and that the conclusions reached are not entirely satisfactory, but I have endeavored so to present the varied phenomena of the art that the student may readily reach deductions of his own. A correspondingly careful study of other branches of art will probably enable us finally to form a just estimate of the relative importance of the forces and tendencies concerned in the evolution of decoration.

SMITHSONIAN INSTITUTION——BUREAU OF ETHNOLOGY.

AIDS TO THE STUDY

OF

THE MAYA CODICES.

BY

PROF. CYRUS THOMAS.

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AIDS TO THE STUDY OF THE MAYA CODICES.

By Cyrus Thomas.

INTRODUCTION.

The object of this paper is to present to students of American paleography a brief explanation of some discoveries, made in regard to certain Maya codices, which are not mentioned in my previous papers relating to these aboriginal manuscripts.

It is apparent to every one who has carefully studied these manuscripts that any attempt to decipher them on the supposition that they contain true alphabetic characters must end in failure. Although enough has been ascertained to render it more than probable that some of the characters are phonetic symbols, yet repeated trials have shown beyond any reasonable doubt that Landa's alphabet furnishes little or no aid in deciphering them, as it is evidently based on a misconception of the Maya graphic system. If the manuscripts are ever deciphered it must be by long and laborious comparisons and happy guesses, thus gaining point by point and proceeding slowly and cautiously step by step. Accepting this as true, it will be admitted that every real discovery in regard to the general signification or tenor of any of these codices, or of any of their symbols, characters, or figures, or even in reference to their proper order or relation to one another, will be one step gained toward the final interpretation. It is with this idea in view that the following pages have been written and are now presented to the students of American paleography.

It is impracticable to present fac simile copies of all the plates and figures referred to, but it is taken for granted that those sufficiently interested in this study to examine this paper have access to the published fac similes of these aboriginal documents.

CHAPTER I.

THE NUMERALS IN THE DRESDEN CODEX.

Before entering upon the discussion of the topic indicated it may be well to give a brief notice of the history and character of this aboriginal manuscript, quoting from Dr. Förstemann's introduction to the photolithographic copy of the codex,[1] he having had an opportunity to study the original for a number of years in the Royal Public Library of Dresden, of which he is chief librarian:

"Unfortunately, the history of the manuscript begins no further back than 1739. The man to whom we owe the discovery and perhaps the preservation of the codex was Johann Christian Götze, son of an evangelical pastor, born at Hohburg, near Wurzen, in the electorate of Saxony. He became a Catholic, and received his education first at Vienna, then in Rome; became first chaplain of the King of Poland and elector of Saxony; later on, papal prothonotary; presided over the Royal Library at Dresden from 1734, and died holding this position, greatly esteemed for learning and integrity, July 5, 1749. This sketch is taken from his obituary notice in Neue Zeitungen von gelehrten Sachen, Nr. 62, Leipzig, 1749. In his capacity as librarian he went to Italy four times, and brought thence rich collections of books and manuscripts for the Dresden library. One of these journeys took place in 1739, and concerning its literary results we have accurate information from a manuscript, in Götze's handwriting, which is found in the archives of the Royal Public Library, under A, Vol. II, No. 10, and bears the title: 'Books consigned to me for the Royal Library in January, 1740.' Under No. 300 we read: 'An invaluable Mexican book with hieroglyphic figures.' This is the same codex which we here reproduce.

"Götze also was the first to bring the existence of the manuscript to public notice. In 1744 he published at Dresden The Curiosities of the Royal Library at Dresden, First Collection. As showing what value Götze attributed to this manuscript, the very first page of the first volume of this work, which is of great merit and still highly useful, begins as follows: '1. A Mexican book with unknown characters and hieroglyphic figures, written on both sides and painted in all sorts of colors, in long octavo, laid orderly in folds of 39 leaves, which, when spread out lengthwise, make more than 6 yards.'

[1] The work here referred to is entitled Die Mayahandschrift der Königlichen öffentlichen Bibliothek zu Dresden, herausgegeben von Prof. Dr. E. Förstemann, Hofrat und Oberbibliothekar. It contains, besides the chromolithographs of the 74 plates, an introduction published at Leipzig, 1880, 4°.

"Götze continues speaking of this book from page 1 to 5, adding, however, little of moment, but expatiating on Mexican painting and hieroglyphic writing in general. On page 4 he says:

"'Our royal library has this superiority over all others, that it possesses this rare treasure. It was obtained a few years ago at Vienna from a private person, for nothing, as being an unknown thing. It is doubtless from the personal effects of a Spaniard, who had either been in Mexico himself or whose ancestors had been there.'

"On page 5 Götze says:

"'In the Vatican library there are some leaves of similar Mexican writing, as stated by Mr. Joseph Simonius Asseman, who saw our copy four years ago at Rome.'

"Götze therefore received the manuscript as a present on his journey to Italy at Vienna and took it with him to Rome. Unfortunately we know nothing concerning its former possessor. A more accurate report of the journey does not seem to exist; at least the principal state archives at Dresden contain nothing concerning it, nor does the General Directory of the Royal Collections. As appears from the above note, Götze did not know that the Vatican Codex was of an entirely different nature from the Dresden Codex.

"In spite of the high value which Götze set upon the manuscript, it remained unnoticed and unmentioned far into our century. Even Johann Christoph Adelung, who as head librarian had it in his custody and who died in 1806, does not mention it in his Mithridates, of which that part which treats of American languages (III, 3) was published only in 1816, after Adelung's death, by J. S. Vater. This would have been a fitting occasion to mention the Dresden Codex, because in this volume (pp. 13 et seq.) the Maya language is largely treated of, and further on the other languages of Anahuac. Of course it was not possible at that time to know that our manuscript belongs to the former.

"After Götze, the first to mention our codex is C. A. Böttiger, in his Ideas on Archæology (Dresden, 1811, pp. 20, 21), without, however, saying anything that we did not already know from Götze. Still Böttiger rendered great and twofold service: first, as we shall see presently, because through him Alexander von Humboldt obtained some notice of the manuscript, and, second, because Böttiger's note, as he himself explains in the Dresden Anzeiger, No. 133, p. 5, 1832, induced Lord Kingsborough to have the manuscript copied in Dresden.

"We now come to A. von Humboldt. His Views of the Cordilleras and the Monuments of the Indigenous Peoples of America bears on the title page the year 1810, which certainly means only the year in which the printing was begun, the preface being dated 1813. To this work, which gave a mighty impulse to the study of Central American languages and literatures, belongs the Atlas pittoresque, and in this are found, on page 45, the reproductions of five pages of our manuscript. They are Nos. 47, 48, 50, 51, and 52 of Lord Kingsborough. In the volume of text belonging to this atlas Humboldt discusses our

manuscript on pp. 266, 267. When he began his work he knew nothing as yet of the existence of the manuscript. It was brought to his knowledge by Böttiger, whose above named work he cites. Here we learn for the first time that the material of the manuscript consists of the plant metl *(Agave Mexicana,)* like other manuscripts that Humboldt had brought from New Spain. Furthermore, he correctly states the length of leaf as 0.295 and the breadth 0.085 meter. On the other hand, he commits two mistakes in saying that there are 40 leaves and that the whole folded table forming the codex has a length of almost 6 meters, for there are only 39 leaves and the length in question is only 3.5 meters, as calculation will approximately show, because the leaves are written on both sides. Humboldt's other remarks do not immediately concern our problem.

"In 1822 Fr. Ad. Ebert, then secretary and later head librarian, published his History and Description of the Royal Public Library at Dresden. Here we find, as well in the history (p. 66) as in the description (p. 161), some data concerning this 'treasure of highest value,' which indeed contain nothing new, but which certainly contributed to spread the knowledge of the subject among wider circles. We may remark right here that H. L. Fleischer, in his Catalogue of Oriental Manuscript Codices in the Royal Library of Dresden, p. 75, Leipzig, 1831, 4°, makes but brief mention of our codex, as 'a Mexican book of wood, illustrated with pictures, which awaits its Œdipus;' whereupon he cites the writing of Böttiger. The signature of the manuscript here noted, E 451, is the one still in use.

"Between the above mentioned notices by Ebert and Fleischer falls the first and so far the only complete reproduction of the manuscript. Probably in 1826, there appeared at Dresden the Italian Augustino Aglio, a master of the art of making fac similes by means of tracing through transparent substances. He visited the European libraries, very probably even at that time under orders from Lord Kingsborough, to copy scattered manuscripts and pictures from Mexico or seemingly from Mexico.

"Now there arises the question, all important for interpretation, In which shape did the manuscript lie before Aglio? Was it a strip only 3.5 meters in length or did it consist of several pieces?

"To render clear the answer which we proceed to give, it is first necessary to remark that of the 39 leaves of the codex 35 are written on both sides and 4 on one side only, so that we can speak only of 74 pages of manuscript, not of 78. These 74 pages we shall in the following always designate by the numbers which they bear in Lord Kingsborough, and it is advisable to abide by these numbers, for the sake of avoiding all error, until the manuscript can be read with perfect certainty; the 4 empty pages I shall designate with 0 when there is need of mentioning them expressly.

"Furthermore it is necessary to state which of these pages so num-

bered belong together in such way that they are the front and back of the same leaf. This condition is as follows: One leaf is formed of pages 1 45, 2 44, 3 43, 4 42, 5 41, 6 40, 7 39, 8 38, 9 37, 10 36, 11 35, 12 34, 13 33, 14 32, 15 31, 16 30, 17 29, 18 0, 19 0, 20 0, 21 28, 22 27, 23 26, 24 25, 46 74, 47 73, 48 72, 49 71, 50 70, 51 69, 52 68, 53 67, 54 66, 55 65, 56 64, 57 63, 58 62, 59 61, 60 0. [That is to say, each pair of this series forms one leaf, one page on one side and the other on the reverse side of the leaf.]

"But now we are justified in the assumption, which at least is very probable, that neither did Aglio change arbitrarily the order of the original, nor Lord Kingsborough the order of Aglio. Consequently Aglio must already have had the manuscript before him in two pieces, be it that the thin pellicles by which the single leaves are connected were loosened in one place or that the whole was separated only then in order not to be obliged to manipulate the whole unwieldy strip in the operation of copying. A third possibility, to which we shall presently return, is that of assuming two separate pieces from the beginning; in this case Götze and the others must be supposed to have seen it in this condition, but to have omitted the mention of the circumstance, believing that the original unity had been destroyed by tearing.

"Of the two pieces one must have comprised 24, the other 15 leaves. But Aglio copied each of the two pieces in such way as to trace first the whole of one side and then the other of the entire piece, always progressing from left to right, in European style. Therefore Aglio's model was as follows:

"*First piece:*

"Front (from left to right): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24.

"Back (from right to left): 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 0, 0, 0, 28, 27, 26, 25.

"*Second piece:*

"Front (from left to right): 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60.

"Back (from right to left): 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 0.

"In considering this, our attention is attracted by the position of the four blank pages, three of which are together, the fourth alone. It might be expected that the separate blank page began or concluded the second piece and was purposely left blank, because in the folding of the whole it would have lain outside and thus been exposed to injury; the other three would be expected at the end of the first piece. The former, as is easily seen, was quite possible, but the latter was not, unless we assume that even at the time Aglio took his copy the original order had been entirely disturbed by cutting and stitching together again. The four blank pages show no trace of ever having contained writing; the red brown spots which appear on them are to be found also on the sides that contain writing. Perhaps, therefore, those three continuous pages indicate a section in the representation; perhaps it was intended to fill them later on; in a similar way also

page three has been left unfinished, because the lower half was only *begun* by the writer.

"I do not wish to conceal my view that the two pieces which Aglio found were separated from the beginning; that they belong even to two different manuscripts, though written in the same form; but, since it is human to err, I will here and there follow custom in the succeeding pages in speaking of one codex.

"My conviction rests especially on the fact that the writer of manuscript A (pp. 1–45) endeavors to divide each page by two horizontal lines into three parts, which the writer of manuscript B (pp. 46–74) rarely does. The more precise statement is as follows: In A, pp. 1–23 and 29–43 always show two such lines in red color; pp. 25–28 have no red lines, but clearly show a division into three parts; p. 24 is the only one of this manuscript that has only writing and no pictures and where the greater continuity of the written speech forbids tripartition (here ends one side of the manuscript); finally, p. 45 seems to be marked as the real end of the whole by the fact that it contains three very light lines, dividing it into four parts; moreover, everything on this page is more crowded, and the figures are smaller than on the preceding pages, just as in some modern books the last page is printed more closely or in smaller type for want of space. In the same manner I suspect that p. 1 is the real beginning of the manuscript. This is indicated by the bad condition of leaf 2 44, which has lost one corner and whose page 44 has lost its writing altogether. For, if in folding the codex leaf 1 45 was turned from within outward, somewhat against the rule, leaf 2 44 was the outer one, and p. 44 lay above or below, and was thus most exposed to injury. I will not omit mentioning that my attention has been called by Dr. Carl Schultz-Sellack, of Berlin, to the possibility of leaves 1 45 and 2 44 having been fastened to the rest in a reversed position, so that 43, 1 and 2 and on the other side 44, 45, 3 were adjoining; then the gods would here be grouped together, which follow each other also on pages 29 and 30. It cannot be denied that this supposition explains the bad condition of leaf 2 44 still better, because then it must have been the outermost of the manuscript; 44 would be the real title page, so to say, and on p. 45 the writer began, not ended, his representation, with the closer writing of which I have spoken, and only afterward passed on to a more splendid style; and this assumption tallies very well with some other facts. But all this can only be cleared up after further progress has been made in deciphering the manuscript.

"In two places, moreover, this first manuscript shows an extension of the drawings from one page over to the neighboring one, namely, from 4 to 5 and from 30 to 31. This is not found on the second manuscript. From continuity of contents, if we are allowed to assume it from similarity of pictures and partition, we may suppose this manuscript to be divided into chapters in the following manner:

pp. 1–2 (then follows the unfinished and disconnected page 3), 4–17, 18–23 (here follows p. 24, without pictures), 25–28, 29–33, 34–35, 36–41.

"Compared with this, manuscript B rarely shows a tripartition, but on pp. 65–68 and 51–57 a bipartition by one line. A further difference is this, that A out of 45 pages has only one (p. 24) without pictures, while B out of 29 pages has 9 without pictures (51, 52, 59, 63, 64, 70, 71, 72, 73), nothing but writing being found on them. Page 74, differing from all others, forms the closing tableau of the whole; and, similarly, p. 60, the last of the front, shows a peculiar character. A closer connection of contents may be suspected between pp. 46–50, 53–58, 61–62, 65–68.

"The two manuscripts also differ greatly in the employment of the sign, or rather signs, differing little from each other, which resemble a representation of the human eye and consist of two curves, one opening above and the other below and joined at their right and left ends. These signs occur only on 5 out of the 45 pages of Codex A (1, 2, 24, 31, 43), while they occur on 16 pages out of the 29 of Codex B (48, 51, 52, 53, 55, 57, 58, 59, 61, 62, 63, 64, 70, 71, 72, 73).

"I believe that the differences above mentioned, to which others will probably be added, are sufficient to justify my hypothesis of the original independence of the two codices. Whoever looks over the whole series of leaves without preconception cannot escape the feeling, on passing from leaf 45 to leaf 46, that something different begins here.

"Thus the copy of Aglio has made it possible to venture a hypothesis bordering on certainty concerning the original form of this monument. Five years after Aglio had finished the copying there appeared, in 1831, the first volumes of Lord Kingsborough's Mexican Antiquities. The work in the trade cost 175*l.*; the expense of publication had been over 30,000*l.* The eighth and ninth volumes followed only in 1848. The ponderous work has undoubtedly great value from its many illustrations of old monuments of Central American art and literature, which in great part had never been published. As regards the Spanish and English text, it is of much less value. We may pass in silence over the notes added by Lord Kingsborough himself, in which he tries to give support to his favorite hypothesis that the Jews were the first settlers of America. Whoever wishes to obtain exact information concerning the character and contents of the whole work and dreads the labor of lifting and opening the volumes, may find a comprehensive review of it in the Foreign Quarterly Review, No. 17, pp. 90–124, 8vo, London, January, 1832, where he will also find a lucid exposition of the history of the literature of Mexican antiquarian studies.

"In the middle of the third volume of the Mexican Antiquities (side numbers are here absent) there is found the title 'Fac simile of an original Mexican painting preserved in the Royal Library at Dresden,

74 pages.' These 74 pages are here arranged on 27 leaves in the following manner:

Codex A.	Codex B.
1, 2, 3,	46, 47, 48,
4, 5, 6,	49, 50, 51,
7, 8, 9,	52, 53, 54,
10, 11,	55, 56, 57,
12, 13, 14,	58, 59, 60,
15, 16, 17,	61, 62, 63,
18, 19,	64, 65, 66,
20,	67, 68, 69,
21, 22, 23,	70, 71, 72,
24, 25,	73, 74.
26, 27, 28,	
29, 30, 31,	
32, 33, 34,	
35, 36, 37,	
38, 39, 40,	
41, 42, 43,	
44, 45.	

"On the whole, therefore, each leaf in Kingsborough comprises three pages of our manuscript. Why the publisher joined only two pages in the case of 10 and 11, 18 and 19, 24 and 25, and left page 20 entirely separate, I cannot say; but when he failed to add 46 to 44 and 45 it was due to the fact that here there is indication of a different manuscript.

"On January 27, 1832, Lord Kingsborough wrote a letter from Mitchellstown, near Cork, in Ireland, to Fr. Ad. Ebert, then head librarian at Dresden, thanking him again for the permission to have the manuscript copied and telling him that he had ordered his publisher in London to send to the Royal Public Library at Dresden one of the ten copies of the work in folio. The original of the letter is in Ebert's manuscript correspondence in the Dresden library.

"On April 27, 1832, when the copy had not yet arrived at Dresden, an anonymous writer, in No. 101 of the Leipziger Zeitung, gave a notice of this donation, being unfortunate enough to confound Humboldt's copy with that of Lord Kingsborough, not having seen the work himself. Ebert, in the Dresden Anzeiger, May 5, made an angry rejoinder to this "hasty and obtrusive notice." Böttiger, whom we mentioned above and who till then was a close friend of Ebert, on May 12, in the last named journal, defended the anonymous writer (who perhaps was himself) in an extremely violent tone. Ebert's replies in the same journal became more and more ferocious, till Böttiger, in an article of May 25 (No. 150 of the same journal), broke off the dispute at this point. Thus the great bibliographer and the great archæologist were made enemies for a long time by means of our codex.

"From Kingsborough's work various specimens of the manuscript passed into other books; thus we find some in Silvestre, Paléographie universelle, Paris, 1839–'41, fol.; in Rosny, Les écritures figuratives

et hiéroglyphiques des peuples anciens et modernes, Paris, 1860, 4to; and also in Madier de Montjou, Archives de la société américaine de France, 2de série, tome I, table V.

"In 1834 Ebert died, and was followed as head librarian by K. C. Falkenstein. He, unlike his predecessor, strove especially to make the library as much as possible accessible to the public. Visits and examinations of the library became much more frequent, and our manuscript, being very liable to injury, on account of its material, had to be withdrawn from the hands of visitors, if it was desired to make it accessible to their sight. It was therefore laid between glass plates and thus hung up freely, so that both sides were visible. In this position it still hangs in the hall of the library, protected from rude hands, it is true, but at the same time exposed to another enemy, daylight, against which it has been protected only in recent time by green screens. Still it does not seem to have suffered much from light during these four decades; at least two former officers of the library, who were appointed one in 1828 and the other in 1834, affirm that at that time the colors were not notably fresher than now. This remark is important, because the coloring in Humboldt, as well as in Lord Kingsborough, by its freshness gives a wrong impression of the coloring of the original, which in fact is but feeble; it may have resembled these copies some 300 years ago.

"In 1836, when the manuscript was being preserved in the manner indicated, the two unequal parts, which were considered as a whole and which no one seems to have thought susceptible of being deciphered, were divided into two approximately equal parts from considerations of space and for esthetic reasons.

"The first five leaves of Codex A, that is, pp. 1–5, with the backs containing pp. 41–45, were cut off and prefixed to Codex B in such way as to have p. 46 and p. 5 adjoining; when I examined the codex more closely I found that between 5 and 46, and therefore also between 41 and 74, there was no such pellicle as generally connects the other leaves. By this change one part was made to contain 20 leaves, the other 19.

"At the same time another change was made. The three blank pages between pp. 28 and 29 had a marring effect, and they were put at the end by cutting through between leaves 18 0 and 17 29 and turning the severed leaves around, so that p. 24 joined on to p. 29 and 17 to 25. The pellicle loosened on this occasion was fastened again.

"I must expressly state that I have no written or oral account of these two manipulations, but conclude they have taken place merely from a comparison of the present arrangement with that which Aglio must have had before him.

"Thus the arrangement in which I found the manuscript, which it may be best to preserve until my views are recognized, is the following:

"(1) *The diminished Codex A (19 leaves):*

Front: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 25, 26, 27, 28, 0, 0, 0.
Back: 18, 19, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40.

"Or, if we enumerate the numbers on the back from right to left, so that the back of each leaf stands beneath its front:

6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 | 25, 26, 27, 28, 0, 0, 0.
40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29 | 24, 23, 22, 21, 20, 19, 18.

"(2) *The enlarged Codex B (20 leaves):*

Front: 1, 2, 3, 4, 5, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60.
Back: 0, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 41, 42, 43, 44, 45.

"Or, reversing, as in the preceding case, the numbers on the back:

1, 2, 3, 4, 5 | 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60.
45, 44, 43, 42, 41 | 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 0."

One of the most difficult things to account for in regard to this codex is the immense number of numeral characters it contains, many of which appear to have no reference to day or other time symbols.

Although it is not claimed that the key which will fully unlock this mystery has been found, it is believed that the discoveries made will throw considerable light on this difficult subject and limit the field of investigation relating to the signification of the Maya codices.

Before proceeding with the discussion of the subject proposed, it will not be amiss to state, for the benefit of those readers not familiar with these ancient American manuscripts, that the Maya method of designating numbers was by means of dots and lines, thus: • (one dot) signifying one; •• (two dots) two, and so on up to four; five was indicated by a single short straight line, thus, —; ten, by two similar lines, =; and fifteen, by three such lines: ≡.

According to this system, a straight line and a dot, thus, ≐, would denote 6; two straight lines and two dots, ⁚, 12; and three straight lines and four dots, ⁙, 19. But these symbols do not appear to have been used for any greater number than nineteen. They are found of two colors in all the Maya codices, one class black, the other red, though the latter (except in a few instances, where the reason for the variation from the rule is not apparent) are never used to denote a greater number than thirteen, and refer chiefly to the numbers of the days of the Maya week and the numbers of the years of the "Indication" or "week of years." On the other hand, the black numerals appear to be used in all other cases where numbers not exceeding nineteen are introduced. As will appear in the course of this discussion, there are satisfactory reasons for believing that other symbols, quite different from these dots and lines, are used for certain other numbers, at least for 20 and for 0.

In order that the reader may understand what follows, it is necessary to explain the methods of counting the days, months, and years in the order in which they succeed one another. Much relating to this will be found in a previous work,[1] but a particular point needs further explanation.

[1] A Study of the Manuscript Troano, by Cyrus Thomas, pp. 7–15.

According to the older and also the more recent authorities, the Maya years—there being 20 names for days and 365 days in a year—commenced alternately on the first, sixth, eleventh, and sixteenth of the series, that is to say, on the days Kan, Muluc, Ix, and Cauac, following one another in the order here given; hence they are spoken of as Kan years, Muluc years, Ix years, and Cauac years.

Writing out in the form of an ordinary counting house calendar the 365 days of the year, commencing with 1 Kan and numbering them according to the Maya custom (that is, up to thirteen to form their week and then commencing again with one) they would be as shown in Table I.

TABLE I.—*Names and numbers of the months and days of the Maya system.*

	Pop.	Uo.	Zip.	Tzoz.	Tzec.	Xul.	Yaxkin.	Mol.	Chen.	Yax.	Zac.	Ceh.	Mac.	Kankin.	Muan.	Pax.	Kayeh.	Cumhu.	Numbers of the days.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Names of the days.																			
Kan	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	1
Chicchan	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	2
Cimi	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	3
Manik	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	4
Lamat	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	5
Muluc	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	6
Oc	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	7
Chuen	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	8
Eb	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	9
Been	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	10
Ix	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	11
Men	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	12
Cib	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	13
Caban	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	14
Ezanab	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	15
Cauac	3	10	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	16
Ahau	4	11	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	17
Ymix	5	12	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	18
Ik	6	13	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	19
Akbal	7	1	8	2	9	3	10	4	11	5	12	6	13	7	1	8	2	9	20
Intercalated days.																			
Kan																		10	
Chicchan																		11	
Cimi																		12	
Manik																		13	
Lamat																		1	

Each of these eighteen columns forms one month, and the whole taken together, with the 5 days added at the end of the eighteenth month, form one continuous series, the second column following the

first as though placed at the end of it, the third following the second, and so on to the end of the eighteenth. Whether or not it was the ancient custom to include the 5 added days in the year, as asserted by the old Spanish writers, is somewhat doubtful, at least in studying the Dresden Codex, we shall find but few occasions, if any, to use them, for there are few if any positive indications in this codex that they were added.

As stated, each column of the table forms a month, though the numbering is carried to thirteen only; but at present the chief object in view in presenting it is to use it in explaining the method of counting the days and the intervals of time. The table is in truth a continuous series, and it is to be understood as though the 365 days were written in one column, thus:

1. Kan.
2. Chicchan.
3. Cimi.
4. Manik.
5. Lamat.
6. Muluc.
7. Oc.
8. Chuen.
9. Eb.
10. Been.
11. Ix.
12. Men.
13. Cib.
1. Caban.
2. Ezanab, &c.,

the 20 days being repeated over and over in the order in which they stand in the table. This order is never changed; we may commence at whatever point in the series occasion may require, but the order here given must always be maintained, just as in our calendar the order of our days is always Sunday, Monday, Tuesday, &c. In other words, Chicchan must always follow Kan, Cimi must always follow Chicchan, &c.

The method of counting intervals in the Maya calendar is very simple, if these explanations are borne in mind, and may be illustrated thus: Counting 14 days from 1 Kan — the first day of the year given in Table I — brings us to 2 Ezanab (the day we count from being excluded); 12 days more bring us to 1 Oc, in the second column of our table; 17 days more to 5 Manik, in the third column; and 17 days more to 9 Kan, in the fourth column.

The number of the day required is readily ascertained by adding together the number of the day counted from and the number of days to be counted, casting out the thirteens when the sum exceeds this number (excepting where the remainder is thirteen); thus: $1+14-13=2$, the number of the day Ezanab given above. So $1+14+12-13-13=1$, the number of the day Oc, second column, Table I; and $1+14+12+17+17-13-13-13-13=9$, the number of the day

Kan, fourth column. The reason for this is so apparent that it is unnecessary to state it.

Suppose the day counted from is 11 Muluc of the eleventh month, and the number of days to be counted (or the interval) is 19; by adding together the numbers and casting out the thirteens the following result is obtained: $11+19-13-13=4$. Counting forward on the table 19 days from 11 Muluc (the sixth number in the eleventh figure column), we reach 4 Lamat (the fourth day of the twelfth month). When the sum of the numbers is a multiple of 13 the number obtained is 13, as there can be no blanks, that is to say, no day without a number.

As the plates of the codices are usually divided into two or three compartments by transverse lines, it is necessary to adopt some method of referring to these in order to avoid the constant repetition of "upper," "middle," and "lower" division. On the plan proposed by Dr. Förstemann, in his late work on the Dresden Codex (Erläuterungen zur Mayahandschrift der Königlichen öffentlichen Bibliothek zu Dresden), these divisions are designated by the letters *a*, *b*, and *c*; this plan will be adopted in this paper. The letter *a* joined to the number of a plate, therefore, will signify that the division referred to is the upper one, as Plate 12*a*; the letter *b* signifies the middle one where there are three divisions or the lower one where there are but two; and the letter *c* signifies the lowest or bottom division where there are three.

Where reference is made to the fac simile of the Dresden Codex, Kingsborough's colored edition is always to be understood, except where another is specially mentioned.

Running through Plates 36*c* and 37*c* is a continuous line of day symbols and red and black numeral characters as follows, the numbers and names below the characters being explanatory and of course not on the original:

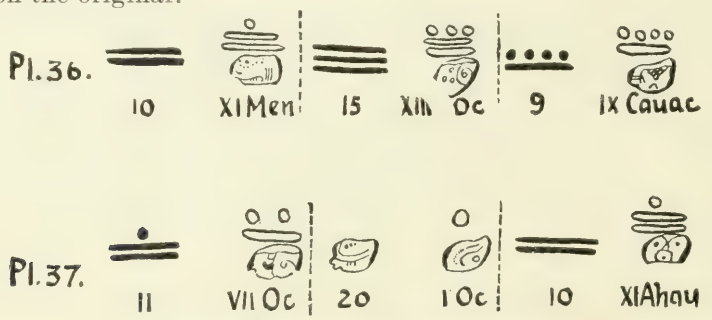

FIG. 359. Lines of day and numeral symbols.

As colors are not used in these figures the red numerals are indicated by hollow or outline dots and lines and the black numerals by solid lines and dots.[1]

[1] This method will be adopted throughout this paper where figures containing numerals are introduced.

In order further to assist those unacquainted with the symbols the same line is here given in another form, in which the names of the days are substituted for the symbols, Roman numerals for the red numbers, and Arabic for the black: 10, XI Men; 15, XIII Oc; 9, IX Cauac; 11, VII Oc; S, I Oc; 10, XI Ahau.

The S is introduced to represent a numeral symbol different from the lines and dots and will be explained when reached in the course of the illustration.

Starting from 11 Men, found in the twelfth figure column of Table I, and counting forward fifteen days, we come to 13 Oc of the thirteenth figure column, the second day of the above quoted line. Counting nine days from 13 Oc[1] brings us to 9 Cauac, the third day of the line; eleven days more, to 7 Oc, the fourth day of the line. Following this day in the line, instead of a black numeral of the usual form, is this symbol: represented by S in the second form, where the names and numbers are substituted for the symbols. Taking for granted, from the position it occupies in the line, that it is a numeral character, it must represent 20, as the day which follows is 1 Oc, and counting twenty days from 7 Oc brings us to 1 Oc. Counting ten days more we reach 11 Ahau, the last day of the line given above.

In this example the black numerals appear to have been used simply as counters, or as numbers indicating intervals; for example, 15 is the interval between 11 Men and 13 Oc.[2]

This furnishes a clew which, if followed up, may lead to important results. That it explains the signification of one symbol undetermined until this relation of the numerals to one another was discovered, is now admitted. In the work of Dr. Förstemann before alluded to the discovery of the symbol for 20 is announced. Although I was not aware of the signification of this symbol until after my second paper, "Notes on certain Maya and Mexican manuscripts," was written, I had made this discovery as early as 1884.[3]

As there will be occasion to refer to the days of the four different series of years (the Cauac, Kan, Muluc, and Ix years), a combined calendar, similar to an ordinary counting house calendar, is introduced here. For the Cauac years the left or Cauac column is to be used; for the Kan years, the Kan column, and so on.

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[1] In the representations of lines and columns of the codex Roman numbers are necessarily used to distinguish the class of numerals, yet in the text, as in this case, the Arabic numbers will be used as most convenient.

[2] Strictly speaking, the interval between 11 Men and 13 Oc is fourteen days, but throughout this paper, by "*interval between*" two days, is to be understood the number of days to be counted *from* one *to and including* the other. The one counted from is always *excluded* and the one reached or with which the interval terminates is always *included*.

[3] Science, p. 459, April 11, 1884.

TABLE II.—*Names and numbers of the four series of years of the Maya system.*

Cauac column.	Kan column.	Muluc column.	Ix column.	1 14	2 15	3 16	4 17	5 18	6	7	8	9	10	11	12	13	Numbers of the months.
																	Days of month.
Cauac	Kan	Muluc	Ix	1	8	2	9	3	10	4	11	5	12	6	13	7	1
Ahau	Chicchan	Oc	Men	2	9	3	10	4	11	5	12	6	13	7	1	8	2
Ymix	Cimi	Chuen	Cib	3	10	4	11	5	12	6	13	7	1	8	2	9	3
Ik	Manik	Eb	Caban	4	11	5	12	6	13	7	1	8	2	9	3	10	4
Akbal	Lamat	Been	Ezanab	5	12	6	13	7	1	8	2	9	3	10	4	11	5
Kan	Muluc	Ix	Cauac	6	13	7	1	8	2	9	3	10	4	11	5	12	6
Chicchan	Oc	Men	Ahau	7	1	8	2	9	3	10	4	11	5	12	6	13	7
Cimi	Chuen	Cib	Ymix	8	2	9	3	10	4	11	5	12	6	13	7	1	8
Manik	Eb	Caban	Ik	9	3	10	4	11	5	12	6	13	7	1	8	2	9
Lamat	Been	Ezanab	Akbal	10	4	11	5	12	6	13	7	1	8	2	9	3	10
Muluc	Ix	Cauac	Kan	11	5	12	6	13	7	1	8	2	9	3	10	4	11
Oc	Men	Ahau	Chicchan	12	6	13	7	1	8	2	9	3	10	4	11	5	12
Chuen	Cib	Ymix	Cimi	13	7	1	8	2	9	3	10	4	11	5	12	6	13
Eb	Caban	Ik	Manik	1	8	2	9	3	10	4	11	5	12	6	13	7	14
Been	Ezanab	Akbal	Lamat	2	9	3	10	4	11	5	12	6	13	7	1	8	15
Ix	Cauac	Kan	Muluc	3	10	4	11	5	12	6	13	7	1	8	2	9	16
Men	Ahau	Chicchan	Oc	4	11	5	12	6	13	7	1	8	2	9	3	10	17
Cib	Ymix	Cimi	Chuen	5	12	6	13	7	1	8	9	3	10	4	11		18
Caban	Ik	Manik	Eb	6	13	7	1	8	2	9	3	10	4	11	5	12	19
Ezanab	Akbal	Lamat	Been	7	1	8	2	9	3	10	4	11	5	12	6	13	20

As this table has been explained in my previous papers it is only necessary to add here that the thirteen figure columns form a single series; therefore, when we reach the bottom of the thirteenth column we go back to the top of the first. The day reached will be the one directly opposite (that is, in the same horizontal line) in the day column for the given year.

For example, taking the fifth column of numbers (the one having 3 for the top figure) and counting down nine days from the top number we reach the number 12. This will be 12 Lamat if a Cauac year, 12 Been if a Kan year, 12 Ezanab if a Muluc year, and 12 Akbal if an Ix year. Therefore it is necessary in counting to refer always to the year (year column) with which the count begins. So long as the particular year referred to is unknown (as is usually the case, the day series being apparently of general rather than of special application) it is immaterial which day column is selected, as the result will be the same with any. This will be apparent if we bear in mind that, when 260 days with their numbers attached have been written down in proper order as a series, we have therein all the possible combinations of days and numbers. This, it is true, does not give us all the months and years (to include these it is necessary to write out fifty-two entire years), but the same series of numerals will be applicable to each of the four year series (Kan, Muluc, Ix, and Cauac years). As any one of the thirteen figure columns of the table may be taken as the commencement of a year and any of the four

day columns may be used, it is apparent that we have all the possible combinations ($4 \times 13 = 52$).

I say above that "it is necessary in counting to refer always to the year (year column) with which the count begins." This I admit does not agree with the generally received idea of the Maya calendar, upon which Table II is constructed, as, according to this theory (which I have accepted in my previous papers), after passing through a year of one series (corresponding with one of the day columns of the table), we should enter upon a year of the next series; for example, when the year 1 Kan is completed we should enter upon the year 2 Muluc.

Although this calendar system seems to have been in vogue at the time of the conquest and is indicated in one or two of the codices, and possibly in the one now under consideration, the chronological series of the latter, as will hereafter appear, do not seem to be based upon it or to agree with it.

These explanations, with the further statement that the lines in the codex are to be read from left to right and the columns from the top downward, except where variations from this rule are noted, will enable the reader to follow the discussion. Another reason for using a table with only thirteen columns (though it would be difficult to devise a combined calendar of any other form) is that the 260 days they contain form one complete cycle, which, as will appear in the course of this discussion, was one of the chief periods in Maya time computations.

Examining Plates 33 to 39 of the codex the reader will observe that the line already alluded to extends continuously through division *c*, commencing with the two characters over the figure (picture) in the lower right hand corner of Plate 33.

The first of these characters as given in Kingsborough's work is the symbol of the day Ezanab, with the red numeral 13 to the left of it and the black numeral 9 over it; but referring to Förstemann's photolithographic copy of the codex it is found to be the symbol of Ahau.

The entire line, with this correction (that is to say, as given by Förstemann), is represented in Fig. 360. In order to assist the reader, the names of the days and numbers of the symbols have been added immediately below the characters.

As the year to which the line relates is unknown, we select the Muluc series, designated "Muluc column" in Table II, and commence with 13 Ahau, the twelfth number of the third figure column. Counting 9 days from this brings us to 9 Muluc, the top number of the fourth figure column and also the second day of the line above given (the symbol is a face in Kingsborough's copy, but is plainly the Muluc sign in Förstemann's photograph). Eleven days more bring us to 7 Ahau, the third day of the above line; 20 more to 1 Ahau, the fourth day of the line (the 20 here is the symbol represented

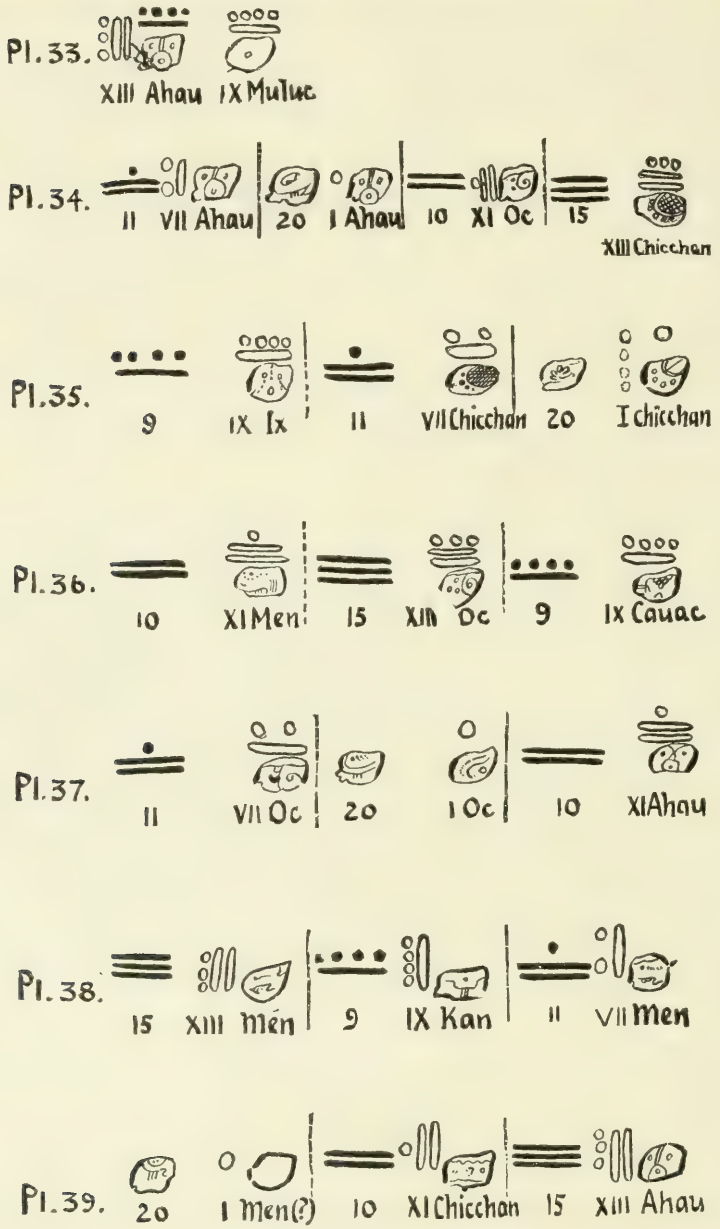

Pl. 33.
XIII Ahau IX Mulue
Pl. 34.
11 VII Ahau 20 I Ahau 10 XI Oc 15
XIII Chicchan
Pl. 35.
9 IX Ix 11 VII Chicchan 20 I Chicchan
Pl. 36.
10 XI Men 15 XIII Oc 9 IX Cauac
Pl. 37.
11 VII Oc 20 I Oc 10 XI Ahau
Pl. 38.
15 XIII Men 9 IX Kan 11 VII Men
Pl. 39.
20 I Men(?) 10 XI Chicchan 15 XIII Ahau

FIG. 360. Line of day and numeral characters.

by S); 10 more to 11 Oc, the fifth day of the line; 15 more to 13 Chicchan, the sixth day of the line; 9 more to 9 Ix, the seventh day of the line; 11 more to 7 Chicchan, the eighth day of the line; line; 20 (S) more to 1 Chicchan, the ninth day of the line; 10 more to 11 Men, the tenth day of the line, and so on to the end.

That the order of the series may be clearly seen the numbers are given here as they stand in the line, omitting the days: XIII; 9, IX; 11, VII; 20, I; 10, XI; 15, XIII; 9, IX; 11, VII; 20, I; 10, XI; 15, XIII; 9, IX; 11, VII; 20, I; 10, XI; 15, XIII; 9, IX; 11, VII; 20, I; 10, XI; 15, XIII.

By adding together a black numeral and the preceding red one and casting out thirteen (or thirteens, as the case may be), when the sum exceeds this number, we obtain the following red one, thus: XIII+9−13=IX; IX+11−13=VII; VII+20−13−13=I; I+10=XI, and so on through the entire series. Attention is also called to the fact that the sum of the black (Arabic) numbers 9, 11, 20, 10, 15, 9, 11, 20, 10, 15, 9, 11, 20, 10, 15, 9, 11, 20, 10, 15, is 260, a multiple of 13.

If this relation of days and numerals holds good as a general thing throughout the codex, it is apparent that where the break is not too extensive it will enable the student to restore the missing and defective numerals and day symbols, to detect the errors of both copyists and original artists, and to determine the proper relation of the plates to one another. By it he learns, as before stated, that the symbol (see page 273) denotes 20, and if phonetic probably stands for the Maya word *Kal*.

Comparing Plates 42 and 43 with Plates 1 and 2, the resemblance is found to be so strong as to lead to the belief that they belong together. It is apparent from the figures, numerals, and characters[1] in the middle division (*b*) of Plates 1 and 2 that they belong together, as they now stand in Kingsborough's work and Förstemann's copy; that Plates 42 and 43 are properly placed in regard to each other is also apparent from the figures and numerals in divisions *a* and *b*.

Taking for granted that the lines are to be read from left to right and the plates to follow each other in the same order, our next step is to ascertain on which side of the pair (Plates 42 and 43) Plates 1 and 2 should be placed.

The series of days and of numbers in Plate 43*b* and Plate 1*b*, which evidently belong together, can only be brought into proper relation by placing the latter to the right of the former. Yet, strange as it may appear, the days and numerals in this division are to be read from right to left, while all the other numeral series of these four plates are to be read as usual, from left to right. This change in the order of the pages also brings together the similar figures in the upper division of these plates. That Plate 42 properly follows Plate 41 is apparent from

[1] Throughout this paper when the words "figure" and "character" are used in reference to what appears in the codex, they are to be understood as follows: "figure" refers to the picture, as of a person, animal, or other object in the spaces; "character" refers to the hieroglyphics or written symbols.

the line of alternate red and black numerals in division *b*. As shown in a previous work[1] and as will appear hereafter, these horizontal lines of alternate red and black numerals without day symbols interspersed are usually, if not always, connected at the left with a column of days over which there is a red numeral, as in the Codex Troano. Running back along the line of numerals in the middle division of Plates 42 and 41, the day column with which it is connected is found at the left margin of Plate 38. Unfortunately the red numeral over this column is obliterated, but can easily be restored. Starting with the first black numeral to the right of this, the entire line, which ends in the second column of the middle division of Plate 43 (representing the black numerals by Arabic numbers and the red by Roman numbers), is as follows: 16, IX; 8, IV; 11, II; 10, XII; 1, XIII; 12, XII; 6, VI(?); 12, IV; 11, II; 11, XIII; 6, VI; 12, V; 7, XII; 6, V; S+1, XIII; 6, VI.

The number over the day column, Plate 38, must have been VI, as VI + 16 − 13 = 9, a conclusion which is sustained by Förstemann's copy, which shows here very plainly the red character for VI.

By adding the black (Arabic) numeral to the preceding red (Roman) one and casting out the thirteens, as heretofore explained, we obtain the following red (Roman) numerals, thus: VI+16−13=IX; IX+8−13=IV; IV +11−13=II; II+10=XII; XII+1=XIII; XIII +12−13=XII; XII+6−13=V.

Here the result differs from what is found at this point in the line, as we obtain V instead of VI. In this case the mistake, if one has been made, cannot be attributed to Lord Kingsborough's copyist; the Maya artist must have made a mistake or there must be an error in the theory here advanced. But let us continue according to our own figures: V+12−13=IV; IV+11−13=II; II+11=XIII; XIII+6−13=VI; VI+12−13=V; V+7=12; XII+6−13=V; V+ 20+1−13=XIII; XIII+ 6 −13=VI.

There is no doubt, therefore, that the line forms one continuous series, and if so it links together pages 38 and 43 as they are now numbered. It follows, then, that if Plates 1 and 2 and Plates 42 and 43 belong together, the former pair must be placed to the right of 43. This is conceded by Dr. Förstemann,[2] as he says that, Dr. Karl Schultz-Sellack having pointed out the error in his paging, he changed pages 1 and 2 to 44 and 45 and pages 44 and 45 to 1 and 2; that is to say, the two leaves containing these pages were loosened from the strip and reversed, so that page 1 would be 44 and page 2 would be 45.

Having brought together these plates so that 1 and 2 stand to the right of 43, attention is called to the lines of day symbols running

[1] Study of the Manuscript Troano, by Cyrus Thomas, Chapters II and VII.

[2] Erläuterungen zur Mayahandschrift, p. 2.

through division *c*. Substituting names and numbers as heretofore, they are as follows:

Plate 42: IV Ahau; XII Lamat; VII Cib; II Kan; X Eb; V Ahau; XIII Lamat.
17 8 8 8 8 8 8
Plate 43: IV Chicchan; XII Been; VII Ymix; II Muluc; X Caban; V Chicchan; XIII Been.
17 8 8 8 8 8 8
Plate 1: IV Oc; XII Ezanab; VII Cimi; II Ix; X Ik; V Oc; (?) Ezanab.
17 8 8 8 8 8 8
Plate 2: IV Men; XIII Akbal; VII Chuen; II Cauac; X Manik; V Men; XIII Akbal.
17 8 8 8 8 8 8

The chief objects in view at present in selecting this series are, as before indicated, to prove the relation of the plates to one another and to determine the use of the black numerals which stand under the day symbols. These numerals consist of but two different numbers, the first on each page being 17, the rest 8's.

As the particular year or years to which the series refers is unknown we turn to our calendar—Table II—and select the Kan column, as we find that 4 Ahau, the first day of the series, is the seventeenth day of the year 1 Kan. This corresponds with the first black numeral. Counting 8 days from this we reach 12 Lamat, the second day of our series; 8 more bring us to 7 Cib, the third day of the series; 8 more to 2 Kan; 8 more to 10 Eb; 8 more to 5 Ahau; 8 more to 13 Lamat, and 17 more to 4 Chicchan. The red numeral at this point in some of the colored copies of Kingsborough's work is III, but a close inspection shows the missing dot which has not been colored. IV Chicchan is therefore correct.

Continuing our count, 8 days more bring us to 12 Been; 8 more to 7 Ymix; 8 more to 2 Muluc; 8 more to 10 Caban; 8 more to 5 Chicchan; 8 more to 13 Been; 17 more to 4 Oc; 8 more to 12 Ezanab; 8 more to 7 Cimi; 8 more to 2 Ix; 8 more to 10 Ik; 8 more to 5 Oc, and 8 more to 13 Ezanab. Here the red numeral is wanting, but a comparison of the numbers on the different plates and the order of the series make it evident that it should be XIII.

Continuing our count, 17 more bring us to 4 Men (here a dot is missing in Kingsborough's copy, but is present in the photograph); 8 more to 12 Akbal. Here there is one dot too many, which we may attribute to a mistake of the original artist. Assuming XII to be correct, 8 more bring us to 7 Chuen; 8 more to 2 Cauac; 8 more to 10 Manik; 8 more to 5 Men; 8 more to 13 Akbal, and to the end of our table; thus, if we include the first seventeen days, completing the series of thirteen months or 260 days.

These illustrations will probably satisfy any one that the black numerals in these lines denote the intervals between the days indicated by the symbols and that the series so far examined are to be read from left to right.

Although the succession of days and numbers in the lines of the last example would seem to furnish conclusive evidence that the

whole is one continuous series, yet the peculiar combinations of numbers used by the Maya priests render these series very deceptive. There can be no doubt that the black numbers—8's—are used to indicate the intervals between the days specified; but there is another possible way of explaining the 17 with which the lines on the different plates begin.

Here are four plates, evidently closely related to one another; the lines of days and numbers in the lowest division of each are precisely alike, except as to the days indicated; in the left hand column of characters of each is one of the cardinal point symbols. It is possible, therefore, that these four plates relate to the four different years or series of years; that is to say, one to the Kan years, one to the Muluc years, and so on. This view is somewhat strengthened by the fact that 4 Ahau, first of the line on Plate 42, is the seventeenth day of the first month of the year 1 Kan; 4 Chicchan, first of the line on plate 43, the seventeenth day of the first month of the year 1 Muluc; 4 Oc, the seventeenth day of 1 Ix, and 4 Men the seventeenth day of 1 Cauac. The four figures in the middle division of Plates 1 and 2 seem also to favor this idea, not so much by the peculiar animals represented (of which we have no explanation to give) as by the double symbols from which they are suspended, which I am quite confident denote the union of years or the time at which two years meet—the close of one and the commencement of another—although fully aware that Dr. Förstemann has interpreted them as symbols of the heavenly bodies.[1]

In the text above these figures are seen two characters or symbols of this type, which in all probability, as will hereafter appear, denote or symbolize the "tying of the years." We may also add that the five days of each plate or group are the five assigned, as I have explained in "Notes on certain Maya and Mexican manuscripts," to the cardinal points. For example, those on Plate 42 are Ahau, Eb, Kan, Cib, Lamat.[2] Still it must be admitted, on the other hand, that as the four lines form precisely one complete cycle of 13 months or 260 days there is a very strong inference that they together form one continuous series and that the arrangement into four parts or divisions has reference to the four seasons or four cardinal points. The final decision on this point therefore still remains in doubt.

As it has been shown that Plates 33 to 39 and Plates 38 to 43 are properly placed as they stand in Kingsborough's copy and also in Förstemann's and that Plates 1 and 2 follow Plate 43, we have proof that the following plates succeed one another to the right, as here given: 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 1, 2.

A slight inspection is sufficient to show that Plates 29 to 33 follow one another in the same order, a conclusion which is easily verified by

[1] Erläuterungen zur Mayahandschrift, p. 16.

[2] Bureau of Eth., Third Ann. Rep., pp. 16 et seq.

testing the lines of numerals in the manner explained. It is apparent, therefore, that the following plates form one unbroken series, running from left to right: 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 1, 2; a conclusion which Dr. Förstemann, who has had the opportunity of studying the original, has now reached.

Having ascertained the object and use of at least one class of black numerals and the relation they bear to the days and day numbers, it may be well to test further the discovery by other examples, in order to see how far it holds good and what new facts it may bring out. In doing this it will be necessary to repeat in part what has already been shown by Dr. Förstemann in his late work; but as these discoveries were made independently and before this work came to hand, and as our conclusions differ in some respects from those reached by him, the plan and scope of this paper would be incomplete without these illustrations.

Commencing with the day column in the middle of Plate 35*b* and extending through Plates 36*b* and 37*b* to the right margin of the latter, is a line of alternate red and black numerals, which may be taken as an example of the most common series found in the Dresden and other codices. It is selected because it is short, complete, and has no doubtful symbols or numerals in it.

Using names and numbers in place of the symbols, it is as follows:

I.
Caban, 11, XII; 6, V; 9, I; 4, V; 7, XII; 9, VIII; 6, I.
Muluc.
Ymix.
Been.
Chicchan.

In this case the red numeral over the day column is I. It is to be observed that the last number of the series is also I, a fact which it will be well to keep in mind, as it has an important bearing on what is now to be presented. But it is proper to show first that this series is continuous and is connected with the day column.

Adding the I over the column to the 11, the first black numeral, gives XII, the red numeral following the 11. That this holds good in all cases of this kind will become apparent from the examples which will be given in the course of this discussion. Adding together the remaining pairs, as follows: XII+6−13=V; V+9−13=1; 1+4=V; V+7=XII; XII+9−13=VIII; VIII+6−13=I, we obtain proof that the line is one unbroken series. It is apparent that if the black numerals are simply counters used to indicate intervals, as has been suggested, then, by adding them and the red numerals over the column together and casting out the thirteens, we should obtain the last red number of the series. In this case the sum of the numbers I, 11, 6, 9, 4, 7, 9, 6, is 53; casting out the thirteens the remainder is I, the last of the series. If we take the sum of the black numbers, which

in this case is 52, and count the number of days on our calendar (Table II) from 1 Caban, the fourteenth day of the first month of the year 1 Kan, we shall find that it brings us to 1 Muluc, the sixth day of the fourth month; 52 days more to 1 Ymix; 52 more to 1 Been, and 52 more to 1 Chicchan, thus completing the day column in the example given. This proves, in this case at least, that the red numeral over the day column applies to all the days of the column and that the whole numeral series — that is to say, the sum of the counters — represents the interval between the successive days of the column. The total number of days from 1 Caban, first of the column, to 1 Chicchan, the last, is 208. Adding 52 more gives 260 and brings us back to 1 Caban, our starting point.

It will be observed that the sum of the black numbers — which denotes the interval between the days of the column — is 52, which is a multiple of 13, the number of days in a Maya week. It follows, therefore, that so far as this rule holds good the last red numeral of the series must be the same as that over the day column. In a former work[1] I explained the method of ascertaining the relations of the days of a column to one another by means of the intervals without reference to the numbers attached to them, a subject to which Charency had previously called attention;[2] by the explanation now given we ascertain the true intervals between the days *as numbered.* The two modes therefore form checks to each other and will aid very materially in restoring obliterated and doubtful days.

There is another point in regard to these series which may as well be illustrated by means of the example given as any other. What is the signification of the red numerals of the series? They are unnecessary if the only object in view was to indicate the intervals between the days of the column. Nor will the supposition that the Mayas had not discovered a means of representing higher numbers than 20 suffice, as the introduction of 13 would have lessened the labor and shortened the calculation. But one answer to this inquiry appears possible, viz, that these numbers are intended to denote certain intermediate days to which importance was for some reason attached. These intermediate days can readily be determined from the data given, and in the present example are as follows:

(1) Between 1 Caban and 1 Muluc they are 12 Lamat, 5 Ix, 1 Akbal, 5 Manik, 12 Ix, and 8 Akbal.

(2) Between 1 Muluc and 1 Ymix they are 12 Ahau, 5 Cimi, 1 Men, 5 Cauac, 12 Cimi, and 8 Men.

(3) Between 1 Ymix and 1 Been they are 12 Eb, 5 Ezanab, 1 Manik, 5 Chuen, 12 Ezanab, and 8 Manik.

(4) Between 1 Been and 1 Chicchan they are 12 Kan, 5 Oc, 1 Cauac, 5 Akbal, 12 Oc, and 8 Cauac.

[1] Study of the Manuscript Troano, by Cyrus Thomas, pp. 15, 16.

[2] Déchiffrement des écritures calculiformes ou Mayas, par M. le C^te H. de Charency, Alençon, 1849; also, Mélanges, pp. 185–195.

These, as will be readily perceived, are found by counting on the calendar from 1 Caban, 1 Muluc, &c., as heretofore explained.[1]

Our interpretation of the series of this particular class is now complete, except as to their application or the object in view in forming them and the determination of the particular years to which they apply. Possibly they may be of general application, so far as consistent with the calendar system. The conclusion on this point depends largely upon the conclusion as regards the system, as it is evident their location in time — if the year of 365 days and the four series of years formed the basis of the system — would not correspond with their position in a system based upon the year of 360 days, in which the four year series does not play any necessary part.

Dr. Förstemann calls attention to the fact that the pairs of numerals representing the intermediate days are usually placed in separate compartments, each containing a figure or a picture generally symbolic or of a priest dressed to indicate some particular god. It is therefore very probable that these intermediate days are to be devoted to ceremonies relating to the divinities or subjects indicated by these figures.

In order to confirm the theory we are now discussing and at the same time show some of the different varieties of the series of the type now under consideration, the following additional examples are given.

In the middle division of Plate 5 is a day column and a numeral series, as follows:

I.
Manik
Cauac
Chuen
Akbal
Men

16, IV; 9, XIII; S + 5, XII; 2, I.

This series terminates with I, as it should according to the theory. The sum of the black numerals — 16, 9, 20, 5, 2 — is 52, a multiple of thirteen, and the interval between the successive days, reading downwards, is 52, agreeing in these particulars with the theory. It will also be observed that the symbol represented by S answers to the number 20.

In the lowest division of the same plate is another similar series, as follows:

XII
Ezanab
Akbal
Lamat
Been
Ezanab

20 + 9, II; 11, XIII; 18, V; 7, XII.

This terminates with XII, the number over the column; the sum of the black numbers is 65, a multiple of thirteen and precisely the interval between the successive days of the column, taking the week numbers into consideration, which is always to be understood in speaking of these intervals unless the contrary is expressly stated.

[1] For an explanation of the principle upon which these day columns were formed, see "Notes on certain Maya and Mexican manuscripts," by Cyrus Thomas, published in the Third Annual Report of the Bureau of Ethnology.

In the middle division of Plate 8 is a short series connected with a day column containing the following days, reading downwards, as usual: Manik, Cauac, Chuen, Akbal, Men. The symbol for Akbal (Fig. 361), is a very unusual one, reminding us strongly of a skull, which may possibly have given origin to the symbol. The numerals of the series are as follows: 20 + 6, VIII; 20 + 6, VIII; the number over the column, VIII; and the interval between the days, 52.

FIG. 361.

In Plate 15, division *c*, is the following series, which differs from those given in having two day columns instead of one:

III	III	
Lamat	Ix	
Ahau	Cimi	12, II; 14, III.
Eb	Ezanab	
Kan	Oc	
Cib	Ik	

The final number is the same as that over the columns; the sum of the black numbers is 26, which is a multiple of 13; but in this case in counting the intervals the days are to be taken alternately from the two columns.

Commencing with 3 Lamat on our calendar and counting 26 days brings us to 3 Ix; 26 more to 3 Ahau; 26 more to 3 Cimi, and so on to the end.

In the lower division of Plate 9 is a series arranged as follows:

III	III	VI	VIII
Cauac	Been	3	2
Chuen	Chicchan	XI	II
		3	4
Akbal	Caban	VI	VII
		4	1
Men	Muluc	I	III
Manik	Ymix	7	2

The sum of the black numerals is 26 and the final red number is III, the same as that over the columns. The interval between the days, taken alternately from the two columns, as in the preceding example, is 26. The numbers are also to be taken alternately from the two number columns.

It is apparent that these examples sustain the theory advanced. This will also be found true in regard to all the series of this type in this and the other codices where the copy is correct. Brasseur's copy of the Manuscript Troano is so full of mistakes that no satisfactory examination of this codex can be made until a photographic copy is obtained; nevertheless a few examples are given as proof of the above statement.

In the third division of Plate XI* is the following series:

IV	
Ahau	17, VIII; 13, VIII; 10 V; 12, IV.
Eb	
Kan	
Cib	
Lamat	

As will be readily seen, after the explanations given, this agrees with the theory advanced.

The last red number is the same as that over the day column, the sum of the black numbers is 52, and the interval between the days 52.

Commencing in the right margin of the lowest division of Plate XXIII* and running through Plates XXII* and XXI*, is the series here represented:

VII	VII	
Cib	Cimi	
Ik	Eb	7, I; 7, VIII; 7, II; 5, VII.
Lamat	Ezanab	
Ix	Kan	
Ahau	Oc	

An examination of this shows it to be of the type of the double column series of the other codex, except that here the days of one column are to be taken in the order in which they stand before proceeding to the other column. The sum of the black numbers is 26 and the interval between 7 Cib and 7 Ik 26 days. The interval between 7 Ik and 7 Lamat, 7 Lamat and 7 Ix, and between 7 Ix and 7 Ahau is, in each case, 26 days. The interval between 7 Ahau, last day of the left hand column, and 7 Cimi, the first day of the right hand column, is also 26 days.

The order in which the days of these double column series of this manuscript follow one another is not uniform, as in some cases (see Plate XXV*, division *a*) they are to be taken alternately from the two columns, as in the examples heretofore given from the Dresden Codex.

In the middle division (Plate XXXIII*, same codex) is a series of the following form, but with the days so nearly obliterated that restoration is necessary:

	VI	I
	5	8
I	VI	I
Ymix (?)	5	8
Cimi (?)	VI	I
Chuen	5	8
Cib (?)	VI	I
(?)	5	8
	VI	I
	5	8

The symbol of the first day has only the upper circle of dots to indicate that it is Ymix, that of the second day is almost obliterated, the third is clearly Chuen, the lower half of the fourth is obliterated, and the interior of the fifth is a blank.

Fortunately there are sufficient data by which to make the restoration. Chuen, we observe, is the middle of the column; that is, two days are above it and two days below it; the sum of the black numerals is 65; hence the interval between the days, considering the week numbers as attached, is 65, and the simple interval in the month series, without regard to the week numbers, is 5. Counting

back on our calendar (Table II) 65 days from 1 Chuen we reach 1 Cimi, and 65 more bring us to 1 Ymix. In like manner we find the fourth day to be 1 Cib and the fifth 1 Ymix. The numbers in the figure columns are to be taken alternately, thus: 5, VI; 8, I; 5, VI; 8, I, &c.

These examples are sufficient to show that the series of the Manuscript Troano are arranged upon the same plan and based upon the same system as those of the Dresden Codex. The following examples from the Codex Cortesianus prove the same thing to be true in reference to the series found in it.

The first is taken from the lower division of Plates 10 and 11, Rosny's reproduction:

XIII		
Ahau	}	11, XI; 5, III; 5, VIII; 5, XIII; 9, IX; 3, XII; 6, V; 1, VI; S, XIII.
Chicchan		
Oc		
Men		

The S in the line of numerals represents the usual symbol for 20. The sum of the black numbers is 65, the interval between the days 65, and the last red numeral the same as that over the day column, thus agreeing in plan with those in the other codices.

The following double column series is found in the middle division of Plate 30:

XI	XI	
Ahau	Ymix	}
Eb	Been	} 20+6, XI; 20+6, XI.
Kan	Caban	}
Cib	Chicchan	
Lamat	Manik	

The number 20 is denoted by the usual symbol. The sum of the black numbers is 52 and the interval between the days in each column 52, but in this case there does not appear to be any connection between the columns, there being, in fact, two distinct series.

In the upper division of the same plate is this series:

XI		
Ezanab	VI 8	XI 5
Oc	VI 8	XI 5
Ik	VI 8	XI 5
Ix	VI 8	XI 5
Cimi		

The order in which these numerals are to be read is as follows: 8, VI; 5, XI; 8, VI; 5, XI, &c., which gives, as the final red number of the series, XI, the same as that over the column. The sum of the black numbers is 52 and the interval between the days 52.

Taking for granted that the correctness of the theory advanced is conceded, some attempts at its further application, especially its use in making restorations and corrections in defective series and in settling doubtful questions relating thereto, will now be presented.

In the upper division of Plate 32, Dresden Codex, are the four day columns and lines of numerals over them here represented:

1			
4	13	9	4
15	13	2	11
XIII	XIII	XIII	XIII
Manik	Cib	Chicchan	Ix
Chuen	Ahau	Muluc	Ezanab
Men	Kan	Been	Ik
Cauac	Lamat	Caban	Cimi
Akbal	Eb	Ymix	Oc

Connected with these numbers is a line of alternate black and red numbers running along over the figures of Plates 32 to 39, division *a*. There are several breaks and some partially obliterated characters in it which must be restored in order to use it. It has been selected partly on this account, that the method of filling such breaks and making such restorations may be seen.

Representing the numerals and symbols as heretofore and substituting a cipher where the numbers are wanting or are too much obliterated to be determined by inspection, the series will be as follows: 11, XI; 8+20, 0; 12 (or 13), XIII; 6+20, XIII; 12, VII (?); 16 (?), V; 5, X; 1, XI; 20, V; 12, IV, 6, X; 0, V; 5, X; 7, IV; 12 (?), II; 5, VII; 8, II; 11, 0.

Commencing with the XIII over the day columns and counting as heretofore, we obtain the following result: XIII+11−13=XI; XI+8+20−13−13=XIII. The first blank should therefore be filled with XIII. Continuing, XIII+13−13=XIII; the black numeral in this case should be 13, although apparently 12 in the codex; XIII+6+20−13−13=XIII; XIII+12−13=XII. Here the result obtained differs from the red numeral in the codex, which is apparently one line and two dots, or VII; but, by carefully examining it or inspecting an uncolored copy, the two lines which have been covered in the colored copy by a single broad red line are readily detected. The next black numeral is partially obliterated, the remaining portion indicating 16, but it is apparent from the following red numeral that it should be 19. Making this correction we proceed with our count: XII+19−13−13=V; V+5=X; X+I=XI; XI+20−13−13=V; V+12−13=IV; IV+6=X. The next black numeral is obliterated, but is readily restored, as X+8−13=V; V+5=X; X+7−13=IV. The next step presents a difficulty which we are unable to explain satisfactorily. The black numeral to be counted here, which stands over the animal figure in the upper division of Plate 39, is 12, both in Kingsborough's copy and in Förstemann's photograph, and is clear and distinct in each, and the following red numeral is as distinctly II, whereas IV+12−13=III. Moreover it is evident from the remaining numbers in the line that this red numeral should be II. We may assume that the Maya artist has made a mistake and written 12 instead of 11, which

is evidently the number to be used in the count; but this arbitrary correction should not be resorted to so long as any other explanation is possible. From the fact that immediately under these numbers there are certain symbols which appear to have some reference to the termination of one year or cycle and the commencement of another, it is possible that a supplemental, unnumbered, but not uncounted day has been added. The fact that this interval of twelve days includes the day Ymix lends some probability to this supposition. Using 11 instead of 12, we continue our count as follows: IV+11−13 =II; II+5=VII; VII+8−13=II; II+11=XIII. Thirteen is, therefore, the last number of the series, which is wanting in the codex. The 8 and II next to the last pair of the series are not in line with the other numbers, but thrust into and near the bottom of the column of characters in the upper division of Plate 39. Adding together the black numbers as thus amended and restored, viz, 11, 8, 20, 13, 6, 20, 12, 19, 5, 1, 20, 12, 6, 8, 5, 7, 11, 5, 8, 11, the sum is found to be 208, which is a multiple of 13, and the final number of the series is 13. On the other hand, the sum of the series does not indicate the interval between the days of a column counting downwards, nor between two consecutive days or the corresponding days of two adjoining columns in any direction. The number of days from 13 Manik to 13 Chuen is 104, but counting 208 days from 13 Manik brings us to 13 Men, the third day of the first (left hand) column; 208 more to 13 Akbal, the fifth; 208 more to 13 Chuen, the second; and 208 more to 13 Cauac, the fourth, thus completing the column.

As these columns do not appear to form a continuous series it is possible they pertain to four different series of years, though the fact that each includes more than one year would seem to forbid this idea. It is more probable that they pertain to four different series, to each of which the line of numerals is to be considered as belonging.

The black numerals above the columns present a problem which I am unable to explain. The numbers stand in the original as follows:

1			
4	13	9	4
15	13	2	11

If we suppose that the lowest line denotes days, the one next above, months, and the uppermost, in which there is but a single number, years, the series will appear to be ascending toward the left, with the difference 4 months and 11 days, as shown by addition, thus:

Y.	M.	D.	
	4	11	Numbers over the fourth column.
	4	11	
	9	2	Numbers over the third column.
	4	11	
	13	13	Numbers over the second column.

Doubling the difference and adding we obtain the numbers over the first column:

Y.	M.	D.
	13	13
	9	2
1	4	15

What adds to the difficulty is the fact that if the columns are taken in reverse order the interval between the corresponding days is 4 months and 11 days; that is to say, counting from 13 Ix, first day of the fourth column, to 13 Chicchan, first day of the third column, we find the interval to be exactly 4 months and 11 days; and the same rule holds good throughout, so that reading across the upper line of days, from right to left, and following with the second line in the same way, ending with Akbal, the interval will be 4 months and 11 days between the consecutive days. Another significant fact is that by counting 4 months and 11 days from the first day of the year 1 Kan we reach 13 Ix; counting 9 months and 2 days from the same date brings us to 13 Chicchan; 13 months and 13 days, to 13 Cib; and 1 year and 4 days, to 13 Manik, which corresponds with the regular interval; it is therefore probable that there is an error in the numerals over the first or left hand column.

It is apparent from the illustrations given that in numeral series of the preceding type restorations can be made where not more than two numbers in succession are wanting. Even three can generally be restored if the numbers preceding and those following the break are distinct, but such restorations should be cautiously made.

In the middle division of Plate 9 is a short series where the number over the day column is wanting; moreover, there is uncertainty as to the number of days in the column and as to the signification of the red numerals, which are in pairs in Kingsborough's work instead of single as usual. Is it possible to explain these uncertainties and to reduce them to the usual simple form? Let us make the trial.

The days in the column are apparently the following: Ahau, Muluc, Ix, Cauac, Kan. The symbols, except that for Cauac, are too plain to admit of doubt, and there is no difficulty in reference to Cauac, the question of doubt being with regard to the Ahau, which is partially surrounded by other characters and may, apparently, be as correctly considered a part of the hieroglyphic inscription as of the day column.

Counting on the list of days in the calendar (Table II), as, for example, the Muluc column, we find the interval from Muluc to Ix is 5 days, from Ix to Cauac is 5 days, and from Cauac to Kan 5 days; but the interval from Ahau to Muluc is 9 days. From this fact we may reasonably infer that Ahau does not belong to the column. Moreover, the other 4 days are the four year bearers, and when they occur together the column usually consists of but 4 days, as, for example, in the lowest division of Plate 29 of this codex and Plate

XXXII* of the Manuscript Troano. The numerals are 20; XIII, X; 20, XII, III; the number over the day column, as before stated, is wanting. The interval from 1 Muluc (or 2 or 3 Muluc) to Ix of the same number is 65 days. It is evident, therefore, that one of each pair of red numerals of the series given must be a counter and has been colored red by mistake. As the numbers in the last pair are III and XII, the number over the column must be 3 or 12. Suppose it is 12 and that XIII of the first pair is a counter, then XII+20+13−13−13−13=VI. As the number in the series is X this will not do. Supposing the X of the first pair of red numerals to be the counter, colored by mistake, the result is as follows: XII+20+10−13−13−13=III. This is also wrong, as the remainder should be XIII. Supposing the number over the column to be III and the XIII of the first pair and XII of the second to be the counters, the result agrees with the theory in every particular. Thus, III+20+13−13−13=X; X+20+12−13−13−13=III; and 20+13+20+12=65, the interval between 3 Muluc and 3 Ix. In Förstemann's copy the XIII and XII are black, thus verifying the conclusion here reached.

The series running through Plates 10*c* and 11*c* presents some difficulties which I have, so far, been unable to solve. The day columns and numerals are as follows:

I	XIII	
Ymix	Cimi	
Been	Ezanab	1, I; 5, VI; 10, III; 13, III; 15, V; 9 (?), XIII.
Chicchan	Oc	
Caban	Ik	
Muluc	Ix[1]	

The numerals in this case are very distinct, especially in the photographic copy, and there can be no doubt as to the days. Here the last black number, 9, is wrong; it should be 8, a fact noticed by Förstemann.[2] Making this correction, the series is regular and consistent, so far as it relates to the right hand column, which has the red thirteen over it. But there is no series for the left hand column. Can it be that those who used the manuscript were expected to find the proper numbers by the line given? Possibly this is the reason the other series is not written out, as by adding one to each red number we obtain the proper result, which, if written out, would be as follows: 1, II; 5, VII; 10, IV; 13, IV; 15, VI; 8, I.

In Plate 30*c* are the four day columns here given, with the numeral eleven over each:

XI	XI	XI	XI
Ahau	Chicchan	Oc	Men
Caban	Ik	Manik	Eb
Ix	Cauac	Kan	Muluc
Chuen	Cib	Ymix	Cimi
Lamat	Been	Ezanab	Akbal.

[1] The symbol for this day in Kingsborough resembles Lamat, but the photographic copy makes it Ix, as it should be.

[2] Förstemann, Erläuterungen zur Mayahandschrift, p. 42.

Extending from the right of this group is a numeral series consisting of nine pairs of numbers, each pair the same, 13, XI. The sum of the black numbers (nine 13's) is 117 and the interval between the successive days of each column is 117; thus, from 11 Ahau to 11 Caban is 117 days, and so on down to Lamat, the last of the left hand column. From 11 Lamat to 11 Chicchan (first day of second column) is also 117, and so on to the end of the fourth column. These four columns, therefore, form one continuous series of 2,223 days, commencing with 11 Ahau and ending with 11 Akbal; but, by adding 117 days more, so as to bring us back to 11 Ahau—which appears to be in accordance with the plan of these series—the sum is 2,340 days, or nine cycles of 260 days each.[1]

The interval between the days, without reference to the numbers attached to them, is 17. It may be well to notice here the relation of the intervals between the days when counted in the two ways: (1) the apparent interval, or that which indicates their position in the month; (2) the true interval between the days, indicated by the symbols and numbers. When the first is 6 the latter, as we have found, is 26; when the first is 12 the latter is 52; when the first is 5 the latter is 65, and when it is 17 the latter is 117.

Particular attention is also called here to the fact that so far no indications of the use of the year period of 365 days have been observed; on the contrary the cycle of 260 days appears to be the period to which reference is chiefly made.

Attached to the day column in Plate 29*c* and running into 30*c* is a series which presents a difficulty I am unable to explain. The days and numerals in this case are as follows:

III
Ix
Cauac } 16, VI; 16, IX; 16, XII; 16, (?)
Kan
Muluc

The red numeral over the day column is very distinctly III in Kingsborough's work, but is II, though somewhat blurred, in Förstemann's photograph. As III+16−13=VI, and the remaining numerals agree with this result, III must be correct. Adding together the pairs and casting out the thirteens, thus, III + 16−13=VI; VI + 16−13=IX; IX+16−13=XII; XII + 16−13−13=II, we find the last red number, which is wanting in both copies of the codex, to be II, whereas, according to the theory advanced, it should be III. The sum of the black numerals (four 16's) is 64, while the interval between the days is 65. The only way of correcting the mistake, if one has been made, is by arbitrarily changing the last 16 to 17; but uniformity in the black numerals apparently forbids this change and and indicates that the variation from the usual rule must be accounted for in some other way.

[1] Erläuterungen zur Mayahandschrift, p. 26.

In reference to this series, Dr. Förstemann[1] remarks:

The column of the days has the difference 5; the fifth sign (in this case really superfluous), that of the thirteenth day, appears in a remarkable form, apparently as an inscription on a vessel. The black figures ought to give the sum 65, but we get only 4×16, or 64. But this appears to be merely an oversight by the copyist, for although in the Codex Troano, also, we find 64 several times instead of 65, still this has always appeared to me merely as a sign of the great negligence of the copyist of that manuscript.

Turning to the Manuscript Troano, Plate XXVIII*b, we find a column consisting of the four terminal days of the year, Been, Ezanab, Akbal, and Lamat, which of course have the same relation to one another as the first days. It is evident from the space that only four were intended to be given. The numerals in Brasseur's fac simile are XI; 20, 12, IV; 9, XIII; 10, X; 13, XI.

The red numeral over the column is XI, as is also the last of the series, but the sum of the black numbers is only 64, which would give X as the final number, as is evident from the following operation: XI+32−13−13−13=IV; IV+9=XIII; XIII+10−13=X; X+13−13=X. The interval between the days is 65. We have, therefore, precisely the same difficulty in this instance as in the case from the Dresden Codex under consideration. Moreover, the only method of correcting the mistake, if there is one, is by adding *one* to the last black number. It would be hazardous to assume that two mistakes, precisely the same in every respect, should have been made in regard to these exactly similar series. The probability that a mistake has been made is lessened by the fact that on Plate XXIX*b of the manuscript is another four day column, the last days of the years, as the preceding. The numeral over the column is XIII and the series is as follows: 13, XIII; 20,18, XII; 13, XIII. Adding these and casting out the thirteens, we have this result: XIII+13−13=XIII; XIII+20+18−13−13−13=XII; XII+13−13=XII. This gives XII as the last number when it should be XIII. If a mistake has been made the only method of correcting it is by increasing the last black number by one, as in the other two cases alluded to.

It is proper to state that on the other hand there is another four day column on Plate XXXII*a of the last mentioned codex, the days of which are precisely the same as those on Plate 29c of the Dresden Codex, to wit, Ix, Cauac, Kan, Muluc. The numeral over it is XII and the series is as follows: 13, XII; 13, XII; 13, XII; 13, XII; 13, XII. This presents no difficulty, as it conforms in every respect to the rules given, but only serves to deepen the mystery in the other cases.

Going back to the series on Plate 29c of the Dresden Codex, we observe not only that the days of the column are the four year bearers, but also that one of the four cardinal symbols is found—in the superscription—in each of the four compartments through which

[1] Erläuterungen zur Mayahandschrift, p. 60.

the series extends. It is possible, therefore, that the series is intended to be applied separately to each of the four years. Supposing this to be the case, counting 64 days from 3 Ix would bring us to 2 Ezanab; 64 days from 3 Cauac to 2 Akbal; 64 days from 3 Kan to 2 Lamat; and 64 days from 3 Muluc to 2 Been. It is significant that in each case the day reached is that on which the given year terminates; for example, the Ix years (counting the five added days) terminate on Ezanab; the Cauac years on Akbal &c. If the intention was to have the series terminate with the end of the respective years, then these years must necessarily have been 2 Ix, 2 Cauac, 2 Kan, and 2 Muluc. I must confess that this explanation is not satisfactory; it is thrown out simply as a suggestion.

Running through the middle division of Plates 30 and 31 is this series:

3,	VIII,	3,	VIII,	3,	VIII,	3,	VIII
5,	Oc	5,	Men	5,	Ahau	5,	Chicchan.

Commencing with 8 Oc (omitting for the present the 3 and 5 to the left) and counting thence 3 months and 5 days we reach 8 Men; 3 months and 5 days more and we reach 8 Ahau; 3 months and 5 days more bring us to 8 Chicchan, and 3 months and 5 days more bring us again to 8 Oc, thus completing a cycle of 260 days (13 months) and also accounting for the first pair of numerals — 3 and 5 — in the series. It appears to be a pretty general rule to commence a series of this type with the difference between the numbers of the series. One reason for this is apparent: that is, to complete the cycle of 260 days, to which most, if not all, of these groups appear to refer.

Dr. Förstemann says in regard to this line:[1]

> This is the place where I first discovered how numbers of several figures are to be read; here for the first time I understood that the figure 3 with 5 below it is nothing but $3 \times 20 + 5$, or 65, and that they mean nothing else than the interval between the days, such as we have frequently met with so far; 4×65 is again the well known period of 260 days.

Plate 3 appears to be isolated and unfinished; at least it presents nothing on its face by which it can be directly connected with any other plate of the codex, notwithstanding the change made by Dr. Förstemann, by which 45 was brought next to it. The day column in this case is in the middle compartment of the upper division and consists of the following days: Ahau, Eb, Kan, Cib, Lamat; the red numeral over it is I. The numerals and days are arranged as follows:

(?)	(?)	4, V(?)	15, XIII	
		I		
		Ahau		
8, XIII		Eb		
		Kan		
		Cib		14(?)
		Lamat		

[1] Erläuterungen zur Mayahandschrift, p. 56.

As numerals belonging to two different series are never found in the same compartment it is fair to assume that those of the middle and right compartments pertain to one series. But what shall we say in reference to those in the left compartment, the upper pair of which is almost entirely obliterated? So far we have found no series extending to the left of the day column. Is this an exceptional case? I am inclined to believe it is, for the following reasons:

Taking the 4, V over the bird as the first pair of the series, we have I+4=V, which is so far correct; after this follows the pair in the lower left hand corner, 8, XIII, as V+8=XIII. It is probable that the obliterated pair in the upper left hand corner followed next, then the pair in the upper right hand corner, and last the partly obliterated one in the lower right hand corner. In this case the obliterated pair in the upper left hand corner should be 11, XI, as XIII+11−13=XI, and XI+15−13=XIII, and XIII+14−13−13=I, which makes the terminal red number of the series the same as that over the day column. This restoration requires no change of any of the numbers which can be distinctly read. By adding together the black numbers 4, 8, 11, 15, 14, the sum is found to be 52, precisely the interval between the days of the column. These facts are sufficient to render it more than probable that the restoration and the order as here given are correct. The series as thus given, including the number over the day column, is: I; 4, V; 8, XIII; 11, XI; 15, XIII; 14, I.

This is repeated, because on turning to Dr. Förstemann's comment on this series I find that he has restored and amended it so as to read thus: I; 10, XI; 4, V; 15, XIII; 9, XIII; 14, I; and he remarks that all would be plain sailing if, for the V before and the XIII after 15, we could read II and IV. This is true, but these numbers are too distinct to justify such change; moreover his "9" is not to be found on the page; it is true that the three dots over the line are not exactly spaced, but there are no indications of a fourth; the number is 8 and should, I think, be so read. His 10 is the obliterated black numeral; of course the value attributed to it depends upon the order given to the series. The fragments remaining of the red number of this pair I think warrant his making it XI.

Plates 46, 47, 48, 49, and 50 are peculiar and seemingly have no direct relation to any other part of the codex. In the upper left hand corner of each are four day columns, all more or less injured, but each column evidently contained, originally, thirteen days, or, more correctly speaking, the symbol for one day repeated thirteen times. In every case the day in the first (left hand) column and that in the third column are the same. As the numbers attached to them are absolutely unreadable in Kingsborough and much obliterated in the photograph, I give here restorations for the benefit of those studying this codex. This restoration is easily made by finding the order

of the series, which can be obtained from Plates 49 and 50 of the photographic copy.

Plate 46:

III Cib.	II Cimi.	V Cib.	XIII Kan.
XI Cib.	X Cimi.	XIII Cib.	VIII Kan.
VI Cib.	V Cimi.	VIII Cib.	III Kan.
I Cib.	XIII Cimi.	III Cib.	XI Kan.
IX Cib.	VIII Cimi.	XI Cib.	VI Kan.
IV Cib.	III Cimi.	VI Cib.	I Kan.
XII Cib.	XI Cimi.	I Cib.	IX Kan.
VII Cib.	VI Cimi.	IX Cib.	IV Kan.
II Cib.	I Cimi.	IV Cib.	XII Kan.
X Cib.	IX Cimi.	XII Cib.	VII Kan.
V Cib.	IV Cimi.	VII Cib.	II Kan.
XIII Cib.	XII Cimi.	II Cib.	X Kan.
VIII Cib.	VII Cimi.	X Cib.	V Kan.

Plate 47:

II Ahau.	I Oc.	IV Ahau.	XII Lamat.
X Ahau.	IX Oc.	XII Ahau.	VII Lamat.
V Ahau.	IV Oc.	VII Ahau.	II Lamat.
XIII Ahau.	XII Oc.	II Ahau.	X Lamat.
VIII Ahau.	VII Oc.	X Ahau.	V Lamat.
III Ahau.	II Oc.	V Ahau.	XIII Lamat.
XI Ahau.	X Oc.	XIII Ahau.	VIII Lamat.
VI Ahau.	V Oc.	VIII Ahau.	III Lamat.
I Ahau.	XIII Oc.	III Ahau.	XI Lamat.
IX Ahau.	VIII Oc.	XI Ahau.	VI Lamat.
IV Ahau.	III Oc.	VI Ahau.	I Lamat.
XII Ahau.	XI Oc.	I Ahau.	IX Lamat.
VII Ahau.	VI Oc.	IX Ahau.	IV Lamat.

As the arrangement and the order of the series are readily seen from the two examples given, only the top and bottom lines of the remaining series will be presented.

Plate 48:

I Kan.	XIII Ix.	III Kan.	XI Eb.
*	* *	* *	* *
VI Kan.	V Ix.	VIII Kan.	III Eb.

Plate 49:

XIII Lamat.	XII Ezanab.	II Lamat.	X Cib.
* *	* *	* *	* *
V Lamat.	IV Ezanab.	VII Lamat.	II Cib.

Plate 50:

XII Eb.	XI Ik.	I Eb.	IX Ahau.
* *	* *	* *	* *
IV Eb.	III Ik.	VI Eb.	I Ahau.

A careful examination of these groups will bring to light the following relations of the numbers, days, columns, and series to one another:

The numerals of any one column, counting downwards, differ from

one another by 8; that is to say, by adding 8 to any one and casting out 13 when the sum exceeds that number, the next lower number will be obtained; or, reversing the operation and counting upward, the difference is found to be 5. The true interval between the days of the columns (counting downwards) is 3 months (60 days), a rule which holds good as to all the series and each column. Thus, from 3 Cib to 11 Cib is 3 months, or 60 days; from 11 Cib to 6 Cib, 3 months; from 2 Cimi to 10 Cimi, 3 months, and from 13 Kan to 8 Kan, 3 months.

Counting on the list of the days of the month, without reference to the week numbers attached to them, it will be found that from Cib to Cimi is an interval of 10 days, and from Cib to Kan is an interval of 8 days. This rule holds good as to all the series, showing that all are arranged upon precisely the same plan. The true interval between any day of the first column of either series (the week number attached being considered) and the opposite or corresponding day in the second column, is 4 months and 10 days, that between the corresponding days of the second and third columns is 12 months and 10 days, that between the days of the third and fourth columns is 8 days, and that between the corresponding days of the fourth or last column of one series or plate and the first column of the following series or plate (taking the plates in the order they are paged) is 11 months and 16 days.

In order to illustrate this we will run through the lowest line of each series, taking them in the order of the pages.[1]

These are as follows:

Plate 46:	VIII Cib.	VII Cimi.	X Cib.	V Kan.
Plate 47:	VII Ahau.	VI Oc.	IX Ahau.	IV Lamat.
Plate 48:	VI Kan.	V Ix.	VIII Kan.	III Eb.
Plate 49:	V Lamat.	IV Ezanab.	VII Lamat.	II Cib.
Plate 50:	IV Eb.	III Ik.	VI Eb.	I Ahau.

By counting on the calendar (our Table II), as heretofore explained, the reader will observe that the interval from 8 Cib to 7 Cimi is 4 months and 10 days; from 7 Cimi to 10 Cib is 12 months and 10 days; from 10 Cib to 5 Kan is 8 days; from 5 Kan to 7 Ahau is 11 months and 16 days; from 7 Ahau to 6 Oc, 4 months and 10 days; from 6 Oc to 9 Ahau, 12 months and 10 days; from 9 Ahau to 4 Lamat, 8 days; from 4 Lamat to 6 Kan, 11 months and 16 days, and so on to the end of the series on Plate 50. Referring to the codex the reader will observe at the bottom of each plate and directly under—that is to say, in the same vertical lines as the day columns—two lines of red numerals. It is impossible to determine these in Kingsborough's copy (except on Plate 50), but they can readily be made out on the

[1] The bottom lines are selected because they are less injured in the codex than the top lines, which are in most cases entirely obliterated.

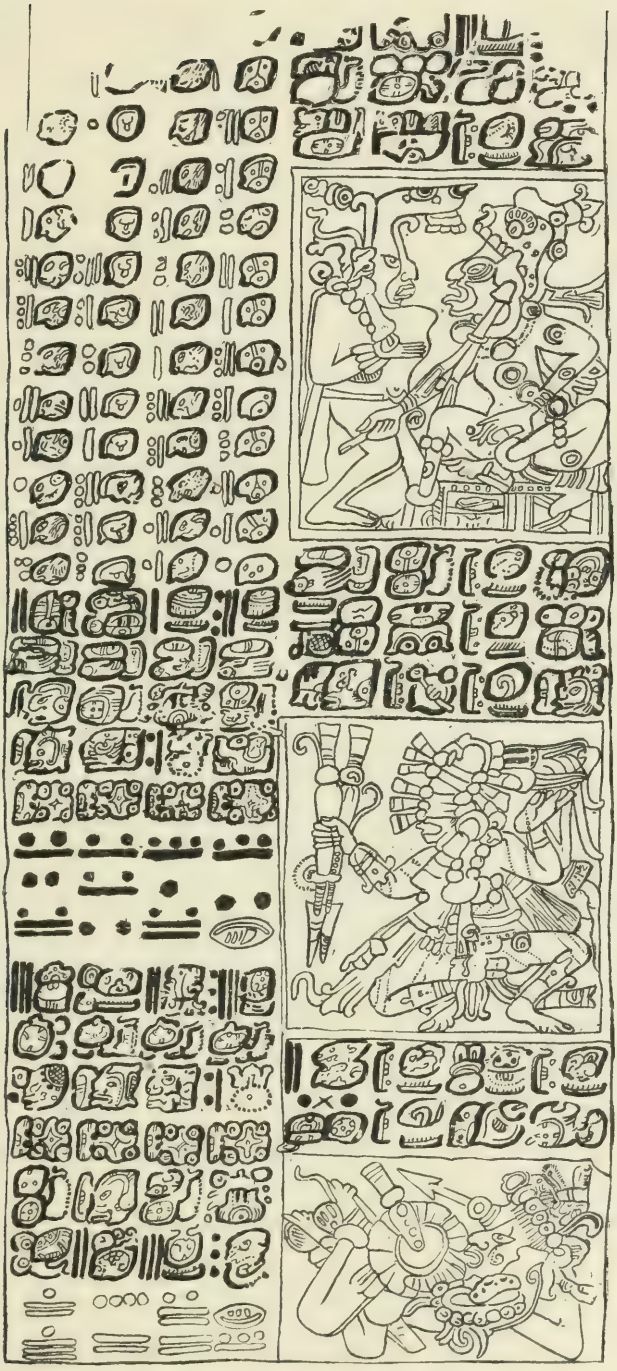


Fig 362. Copy of Plate 50, Dresden Codex.

photographed plates. (See the copy of Plate 50, given in Fig. 362.) Those on a single plate are as follows:

$$\begin{cases} \text{XI, IV, XII, 0,} \\ \text{XVI, X, X, VIII.} \end{cases}$$

The 0 here represents a red, diamond shaped symbol.

If the upper line represents months and the lower line days, these numbers will indicate the intervals between the columns and are properly placed. For example, the XI and XVI signify 11 months and 16 days, the interval between the last column of the preceding plate and the first column of the plate on which they stand; the IV and X, the interval of 4 months and 10 days between the first and second columns; XII and X, the interval of 12 months and 10 days between the second and third columns; and 0, VIII, the interval of 8 days between the third and fourth columns. It is apparent from this that the red, diamond shaped symbol represented by 0 over the VIII denotes a cipher or nought, a conclusion reached independently by Förstemann.

If this supposition as to the arrangement of the series and the signification of these numbers be correct, it is apparent that the plates are to be taken in the order in which they are paged, that is, from left to right, as the others so far noticed, an inference borne out by another fact now to be mentioned.

Immediately below each of these four column day series are four lines of characters (hieroglyphics), and immediately under the latter three horizontal lines of black numerals, with here and there a red, diamond shaped symbol inserted. As these numerals stand directly in the vertical lines of the day columns, it is possible the two have some connection with each other, a supposition somewhat strengthened by what has been observed in regard to the red numerals at the bottom of the plates. To test this and also for the reason that we propose to discuss their relations and their use, we give here the bottom line of days of each of the five series (or plates), together with their week numbers attached; also, the numbers of the three lines of black numerals mentioned, taking them in the order of the paging as here shown:

Plate 46:

VIII Cib.	VII Cimi.	X Cib.	V Kan.
		1	1
11	16	10	11
16	6	16	4

Plate 47:

VII Ahau.	VI Oc.	IX Ahau.	IV Lamat.
2	2	3	3
5	9	4	4
0	10	0	8

Plate 48:

VI Kan.	V Ix.	VIII Kan.	III Eb.
3	4	4	4
16	2	15	15
3 (?)	14	4	12

Plate 49:

V Lamat.	IV Ezanab.	VII Lamat.	II Cib.
5	5	6	6
9	13	8	8
8	18	8	16

Plate 50:

IV Eb.	III Ik.	VI Eb.	1 Ahau.
7	7	8	8
2	7	1	2
12	2	12	0

In considering these horizontal lines it is to be understood that the series runs through the five pages, 46–50.

Let us proceed upon the supposition that the figures of the lowest of the three lines denote days of the month, the numbers of the middle line months, and those of the upper line years. As already shown, the interval between 8 Cib and 7 Cimi is 4 months and 10 days; adding 4 months and 10 days to 11 months and 16 days (bearing in mind that 20 days make a month and 18 months a year), the sum is found to be 16 months and 6 days, precisely the figures under 7 Cimi. As already ascertained, the interval between 7 Cimi and 10 Cib is 12 months and 10 days; this added to 16 months and 6 days gives 1 year, 10 months, 16 days, precisely the figures under 10 Cib. The interval between 10 Cib and 5 Kan is 8 days; this added to the 1 year, 10 months, and 16 days gives 1 year, 11 months, and 4 days, the figures under 5 Kan. The interval between 5 Kan and 7 Ahau is 11 months, 16 days, which, added to the preceding, gives 2 years, 5 months, 0 day, agreeing with the figures under 7 Ahau, if the symbol represented by 0 signifies nought. That this rule holds good throughout the entire series, by making one correction, is shown by the following additions:

Years.	Months.	Days.	
	11	16	Under VIII Cib, Plate 46.
	4	10	
	—	—	
	16	6	Under VII Cimi, Plate 46.
	12	10	
	—	—	
1	10	16	Under X Cib, Plate 46.
		8	
—	—	—	
1	11	4	Under V Kan, Plate 46.
	11	16	
—	—	—	
2	5	0	Under VII Ahau, Plate 47
	4	10	
—	—	—	
2	9	10	Under VI Oc, Plate 47.
	12	10	
—	—	—	

Years.	Months.	Days.	
3	4	0	Under IX Ahau, Plate 47.
		8	
3	4	8	Under IV Lamat, Plate 47.
	11	16	
3	16	4[1]	Under VI Kan, Plate 48.
	4	10	
4	2	14	Under V Ix, Plate 48.
	12	10	
4	15	4	Under VIII Kan, Plate 48.
		8	
4	15	12	Under III Eb, Plate 48.
	11	16	
5	9	8	Under V Lamat, Plate 49.
	4	10	
5	13	18	Under IV Ezanab, Plate 49.
	12	10	
6	8	8	Under VII Lamat, Plate 49.
		8	
6	8	16	Under II Cib, Plate 49.
	11	16	
7	2	12	Under IV Eb, Plate 50.
	4	10	
7	7	2	Under III Ik, Plate 50.
	12	10	
8	1	12	Under VI Eb, Plate 50.
		8	
8	2	0	Under I Ahau, Plate 50.

The proof of the correctness of the theory advanced may, therefore, be considered conclusive, as it amounts, in fact, to a mathematical demonstration.

Dr. Förstemann, who considers these lines of black numbers, standing one above another, as representing different grades of units—thus, the lowest, single units; the second, units twenty-fold the lower; the third, eighteen-fold the second; the fourth, twenty-fold the third, &c.—has found the correct intervals of the series, which he states are 236, 90, 250, and 8 days, agreeing with our 11 months, 16 days; 4 months, 10 days; 12 months, 10 days, and 8 days.

As all the discoveries mentioned herein were made previous to the receipt of Dr. Förstemann's work, I give them according to my own method, acknowledging any modification due to his work. Although I shall compare special results from time to time, an explanation of

[1] 3 days in ms., should be 4.

Dr. Förstemann's method is reserved for a future paper, as his work was not received until I was revising my notes for publication.

The foregoing explanation of the series shows it to be very simple and makes it clear that it relates to the day columns at the top of the pages. Still, there is one point somewhat difficult to understand. Are the numbers of the third or lowest line intended to denote the positions in the month of the days in the columns above? If so, the month must have commenced with Ymix, as can readily be shown in the following manner:

TABLE III.

1. Ymix.
2. Ik.
3. Akbal.
4. Kan.
5. Chicchan.
6. Cimi.
7. Manik.
8. Lamat.
9. Muluc.
10. Oc.
11. Chuen.
12. Eb.
13. Been.
14. Ix.
15. Men.
16. Cib.
17. Caban.
18. Ezanab.
19. Cauac.
20. Ahau.

If we write in a column in proper order the 20 days of the Maya month, commencing with Ymix, and number them consecutively, as in Table III, we shall find by comparison that the numbers in the lower line indicate the position, in this column, of the days directly over them. Take, for example, the lower line of black numerals on Plate 46, writing over them the respective days of the columns, thus:

Cib.	Cimi.	Cib.	Kan.
16	6	16	4

Referring to Table III we see that Cib is the sixteenth day, Cimi the sixth, and Kan the fourth.

The days and numbers of Plate 47 are:

Ahau.	Oc.	Ahau.	Lamat.
0	10	0	8

Ahau is the twentieth day — here is the diamond shaped symbol — Oc is the tenth, and Lamat the eighth, and so on to the end of the series on Plate 50.

It may be justly argued that such relation to some given day of the month would necessarily follow in any series of this kind made up by adding together intervals of days and months. Still it is not at all likely that these series were made up without reference to fitted and determinable dates. If so, the months given must be months of certain determinable years, and the days denoted must be days of particular months. In other words, if we had the proper starting point we should be able to determine the position in the calendar of any day or month mentioned in the series.

First. It is easily seen by reference to the calendar (Table II) that Cib is not the sixteenth day of the month of any of the four years, nor is Cimi the sixth nor Kan the fourth. The idea that the figures of this lower line represent the days of the month must, therefore, be given up unless we assume that the year commenced with Ymix. It may be worthy of notice at this point that the list of days on the so-called "title page" of the Manuscript Troano begins with Ymix. It is also true that the remarkable quadruple series in the Codex Cortesianus on Plates 13–18 commences with Ymix; as this is evidently some kind of a calendar table, its bearing on the question now before us is important.

Second. It can easily be shown that the months referred to in the series, if the numbers given denote specific months, are not those of the Kan years. The first, 8 Cib, if in the eleventh month, must be in the year 4 Kan; counting forward from this 4 months and 10 days to 7 Cimi brings us into the sixteenth month of the year 4 Kan; this agrees with our figures on Plate 46. Counting forward 12 months and 10 days to 10 Cib, we reach the tenth month of the next year; 8 days more carry us to the eleventh month, which still agrees with the figures in the codex. Counting 11 months and 16 days more to 7 Ahau, we reach but do not pass the fourth month of the next year; hence the result does not correspond with the series, which has at this point a 5 in the middle line. The same will be found true in regard to the other years as given in our calendar (Table II). This result, as a matter of course, must follow if the figures in the lower line of the series do not denote the month days of some one of the year series as usually given.

Another fact also becomes apparent here, viz, that the 5 supplemental days of the year are not brought into the count, the year consisting throughout of 360 days. There is, in fact, nothing here indicating the four year series as given in the authorities and as represented in our calendar table; yet this ought to appear wherever a series extends over more than one year.

Dr. Förstemann says that this entire series of black numerals covers 2,920 days, or 8 years of 365 days. This is true, but the concluding figures show that it is given by the writer of the codex as 8 years and 2 months, which would also be 2,920 days, counting the years at

360 days each and the months 20 days each; moreover, the members of the series are based throughout upon the year of 360 days. His theory that the intervals of the series relate to the movements of the planet Venus is, as yet, a mere hypothesis, which needs further proof before it can demand acceptance; but his discovery of the methods of identifying the month symbols on the five plates now under consideration is important. Although I had noticed that most of the characters which he mentions are month symbols, I did not succeed in identifying all of them.

According to his conclusion, which appears to be justified not only by the evidence he gives but by an additional fact that I shall presently mention, there are four of these symbols in the upper row of the middle group of written characters on each plate and four in the upper and lower lines of the lower group on each plate (see, for example, Fig. 362). Each of these symbols (except three or four) has a black number attached to it which denotes the day of the month represented by the symbol.

These months and days as given by Dr. Förstemann are as follows, the positions of the lines as here given corresponding with those of the plates:

TABLE IV.—*Table showing months and days.*

	Month.	Day.	Month.	Day.	Month.	Day.	Month.	Day.
Plate 46	7	4	11	14	5	19	6	7
	11	8	15	18	10	4	10	12
	1	14	6	4	18	14	1	2
Plate 47	18	3	4	8	16	18	17	6
	4	3	8	13	2	18	3 (not 2)	6
	10	10	15	3	9	8	9	16
Plate 48	10	17	15	7	9	12	10	20
	15	2	1	7	13	17	14	5
	3	7	7	17	2	2	2	10
Plate 49	3	11	8	1	2	6	2	14
	7	16	12	6	6	11	6	19
	14	6	18	16	13	1	13	9
Plate 50	14	10	18	20	13	5	13	13
	18	15	5	20	17	10	17	18
	6	20	11	10	5	15	6	3

An examination of the plates will show that Dr. Förstemann has filled out the following obliterated or wanting day numbers, to wit, the first of the upper line of Plate 46, the fourth of the upper line of Plate 47, and the second of the middle line and first of the lower line of Plate 50. He has also ventured to change the first day number of the lower line of Plate 46 from 16 to 14. Where the number 20 is found in his list there is no corresponding number in the codex, the month symbol only being given. It is evident he has proceeded in these cases upon the theory that the absence of a number indicated

that the month was completed. Although probably correct in this conclusion, the question will arise, Does the symbol in such cases denote the *month completed* or the *month reached?*

The intervals between these dates are as follows, the left hand column being those between the first and second columns of Förstemann's list (our Table IV), the second column those between the second and third columns of his list, the third column those between the third and fourth columns of his list, and the fourth column those between the last date of one plate and the first of the next:

TABLE V.—*Table showing intervals between dates.*

	Month.	Day.	Month.	Day.	Month.	Day.	Month.	Day.
Plate 46	4	10	12	5	0	8	11	16
	4	10	12	6*b*	0	8	11	11
	4	10	12	10	0	8	9	8*d*
Plate 47	4	5	12	10	0	8	11	11
	4	10	12	5	0	8*c*	11	16*e*
	4	13*a*	12	5	0	8	11	11
Plate 48	4	10	12	5		8	11	11
	4	5	12	10	0	8	11	11
	4	10	12	5	0	8	11	16
Plate 49	4	10	12	5	0	8	11	16
	4	10	12	5	0	8	11	16
	4	10	12	5	0	8	11	11
Plate 50	4	10	12	5	0	8	11	11
	4	5	12	10	0	8	11	10
	4	10	12	5	0	8	12	11*g*

Although it is apparent that the variations from the intervals of the black numeral and day series above them are too numerous and too uniform to be considered mistakes, yet there is little reason to doubt that these month numbers are connected with and depend upon the day series given in the columns above.

That there are some errors is quite clear; for instance, the variation at *a* arises from the fact that Dr. Förstemann gives the date here as 10 months, 10 days, whereas the codex has it 10 months, 13 days. Making this correction the interval will be 4 months, 10 days. The correction will make the interval at *d* 9, 11, instead of 9, 8. Still there is a variation of two months from the usual interval, which, if corrected on the supposition that Dr. Förstemann has mistaken the month, would necessitate a change of the remainder of the series given in this line. The interval at *c*, according to the figure given by Dr. Förstemann, would be retrograde, that is, minus 12. This arises from the fact that he gives the last date in the middle line on Plate 47 as 2 months, 6 days, whereas the symbol is very distinctly that of the third month, and the eight day series is unbroken if this correction is made.

When these evident errors are corrected the series of intervals show

very clearly a system and periodicity depending on the day column series in the upper part of the pages. In the first column (Table V), the interval is usually 4 months, 10 days, precisely the same as between the first and second day columns, but occasionally it is 4 months, 5 days, which will still bring it to one of the four day series, including the day indicated by the date—4 months, 10 days. This will be understood by examining our calendar (Table II). The corresponding days in the four year columns were, by the Maya system, necessarily brought together in the calendar; for example, they are arranged in the series pictured on Plates 13–18 of the Cortesian Codex precisely as given in our Table II. This skip of five days is also apparent in the second and fourth columns of differences (Table V). Whether Dr. Förstemann is correct in all his identifications of months among the symbols on the five plates now under consideration is a question I feel unqualified to answer without a much more careful comparison and study of these characters than I have given them.

Running through the upper division of Plates 53 to 58 and continued through the lower division of Plates 51 to 58—that is to say, commencing in the upper division of 53 and running into 58, then back to the lower division of 51 and ending in 58—is a remarkable compound series. It consists, first, of a three line series of black numerals standing above; second, a middle series of short, three day columns, or columns each of three day symbols, with red numerals attached; and, third, below, a two line series of numerals, those of the upper line red and of the lower black numbers.

As this series is a very important one in the study of the relations of the numerals to one another and to the days indicated, an exact copy of it is given in Figs. 363–370, each figure representing a page and the whole standing in the same order as in the original. The red numerals and red symbols are, as usual, given in outline as an indication of their color.

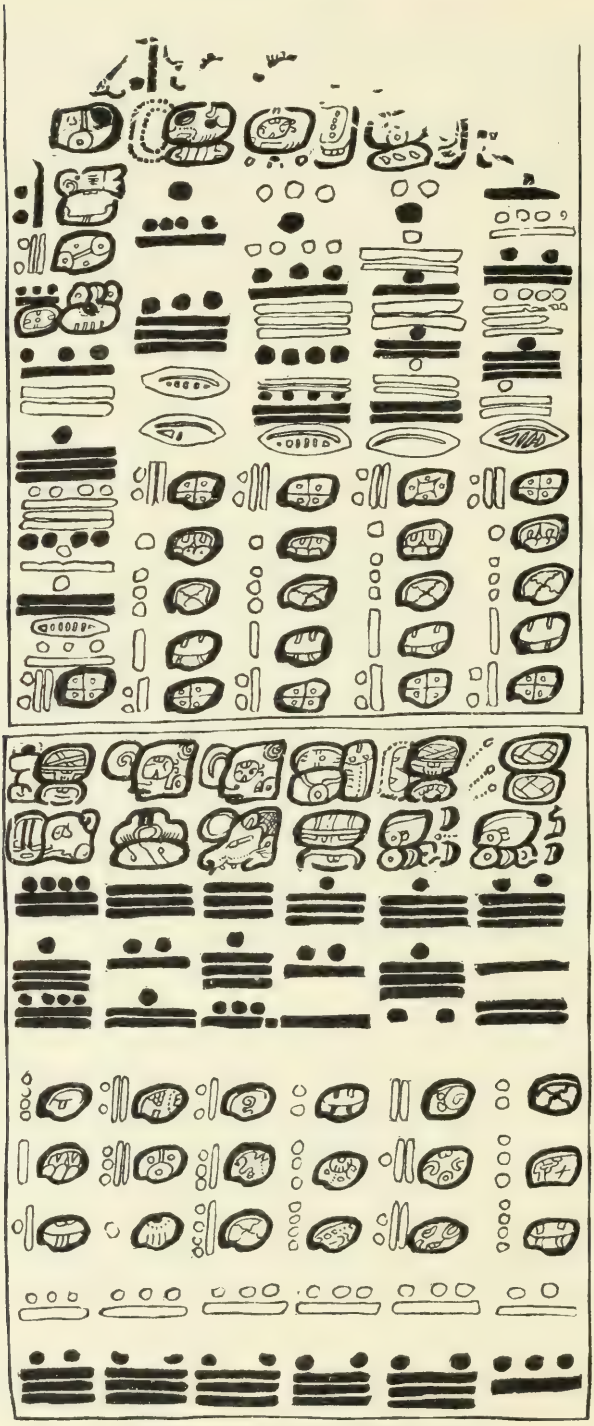


FIG. 363. Copy of Plate 51, Dresden Codex.

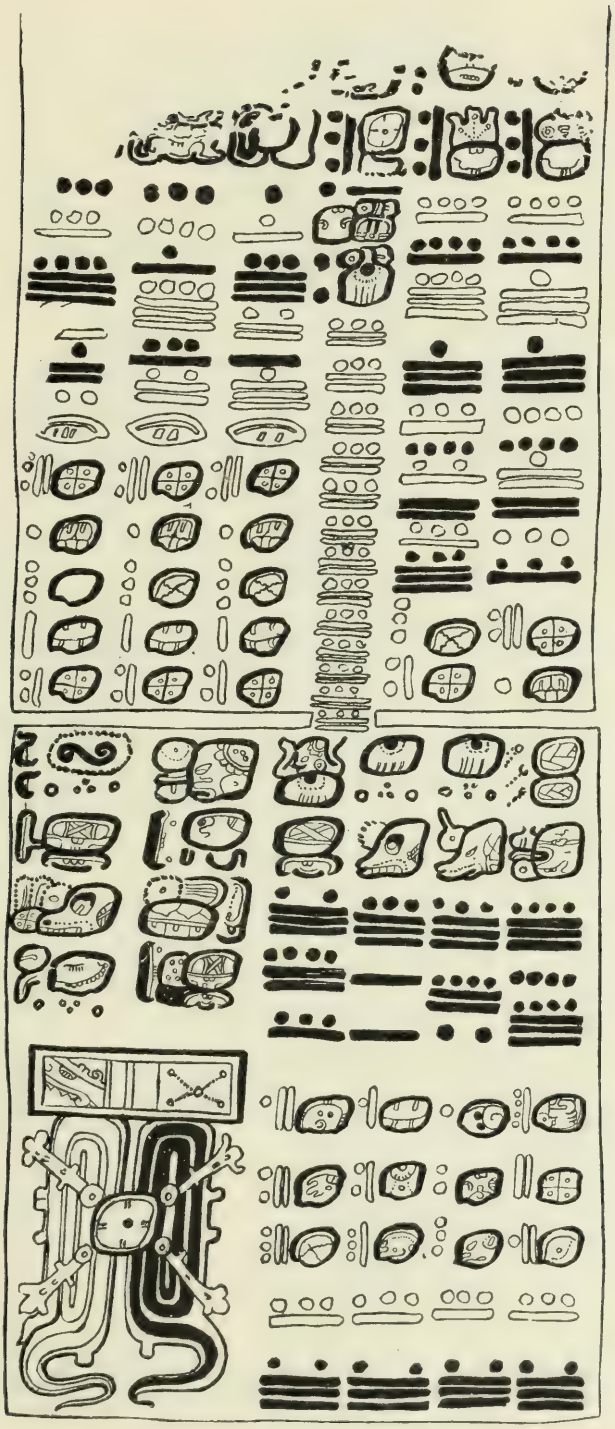


FIG. 364. Copy of Plate 52, Dresden Codex.

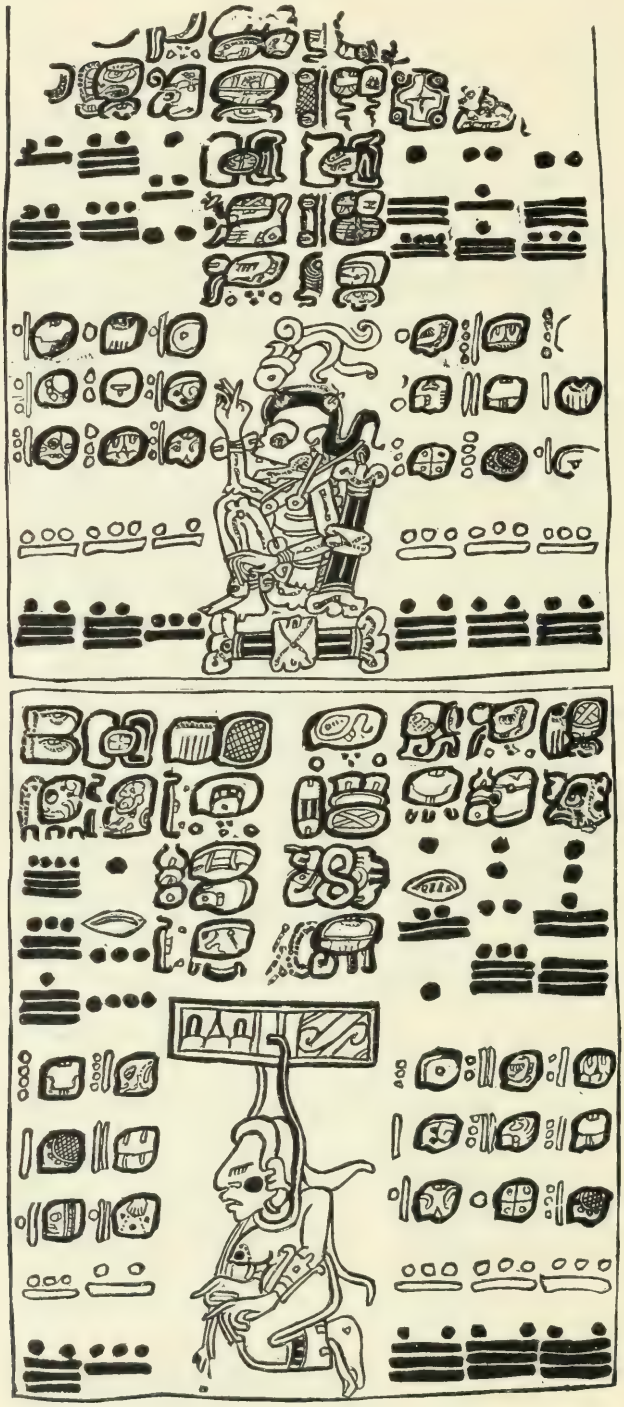


FIG. 365. Copy of Plate 53, Dresden Codex.

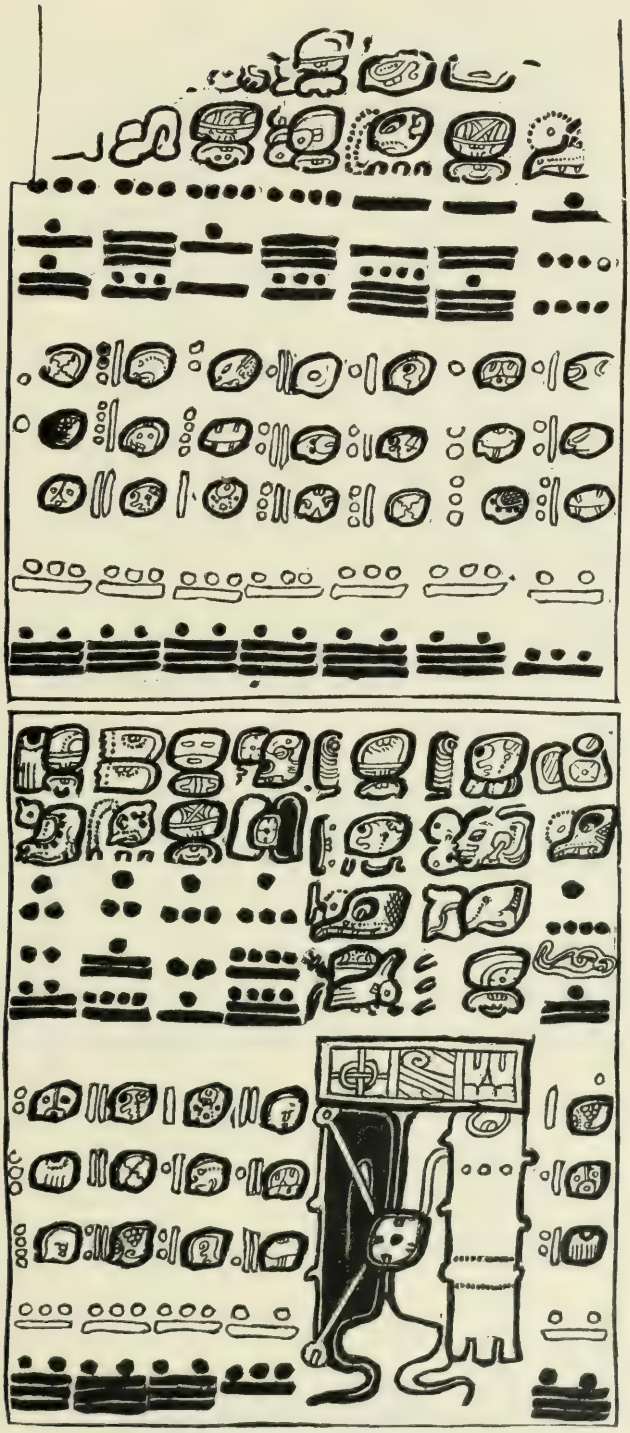


Fig. 366. Copy of Plate 54, Dresden Codex.

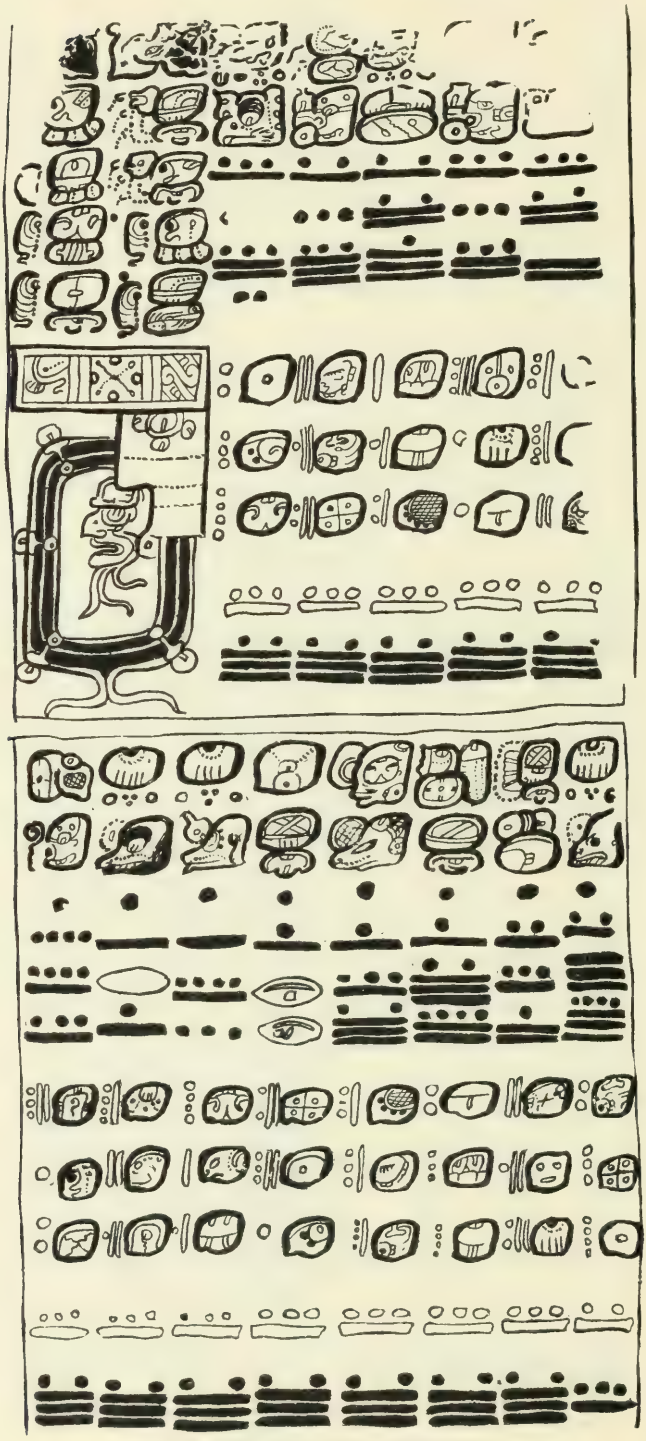


Fig. 367. Copy of Plate 55, Dresden Codex.

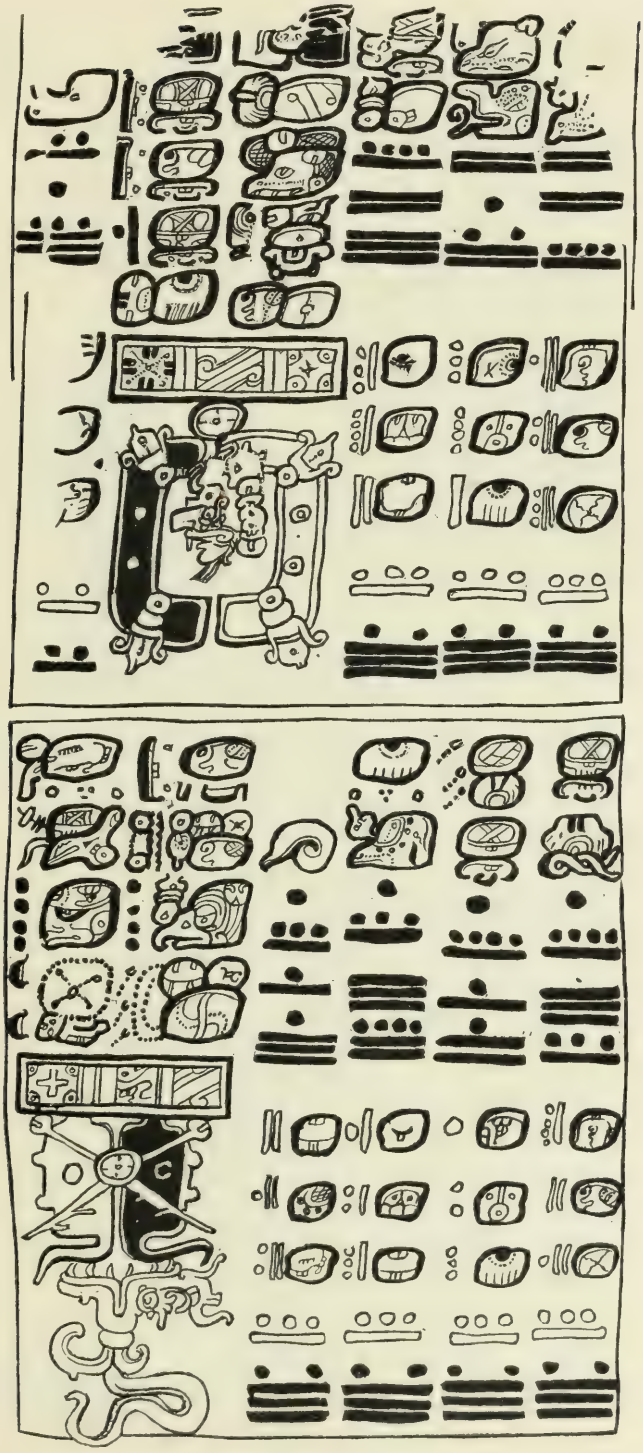


FIG. 368. Copy of Plate 56, Dresden Codex.

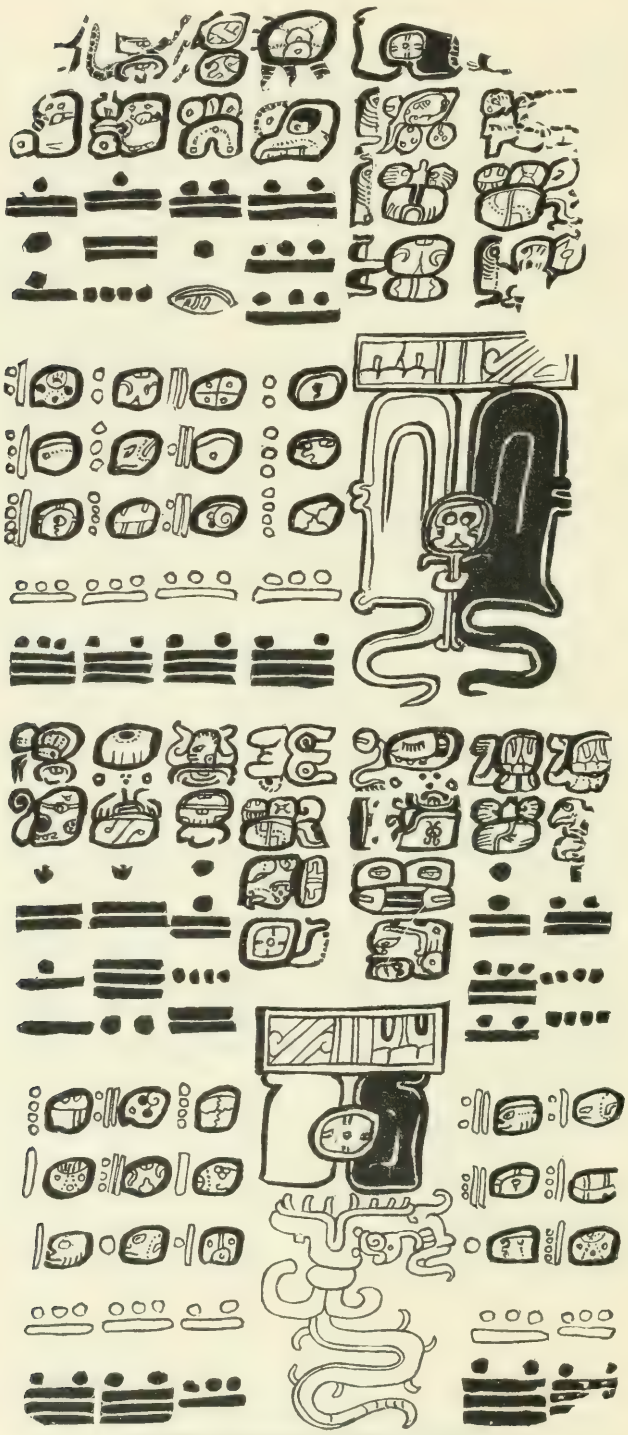


Fig. 369. Copy of Plate 57, Dresden Codex.

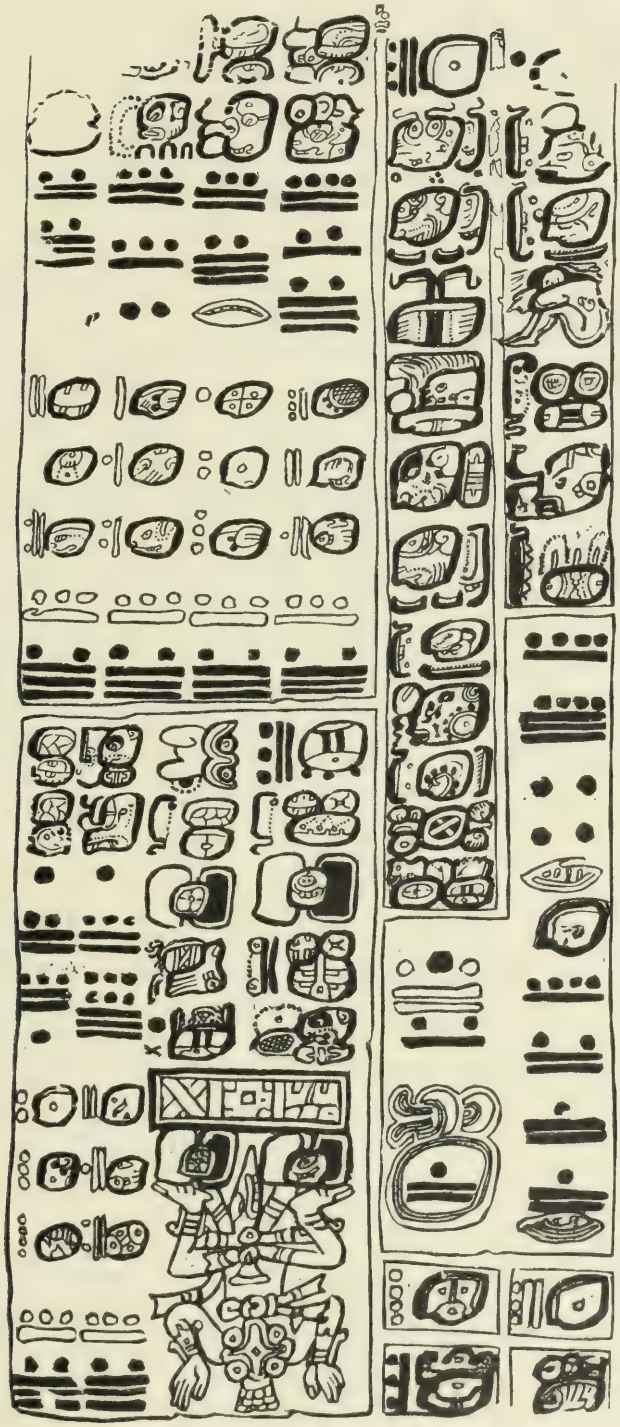


FIG. 370. Copy of Plate 58, Dresden Codex.

In order to assist those not familiar with the numeral and day symbols, the entire series is given in the following tables in names and Arabic and Roman numerals, as usual. The obliterated symbols and numbers are restored.

TABLE VI.—*Table of numeral and day symbols.* (Plate 51*b*.)

14	15	15	16	16	17
16	7	16	7	16	5
14	11	8	5	2	10
IV Ik.	XII Cauac.	VII Cib.	II Been.	X Oc.	II Ezanab.
V Akbal.	XIII Ahau.	VIII Caban.	III Ix.	XI Chuen.	III Cauac.
VI Kan.	I Ymix.	IX Ezanab.	IV Men.	XII Eb.	IV Ahau.[1]
VIII.	VIII	VIII	VIII	VIII	VII
17	17	17	17	17	8

[1] The symbol in this case is that of Been, but this is a manifest error, as Ahau follows Cauac.

TABLE VII.—*Table of numeral and day symbols.* (Plate 52*b*.)

[Picture.]	17	18	18	19
	14	5	14	4
	8	5	2	19
	XI Cib.	VI Been.	I Oc.	IX Manik.
	XII Caban.	VII Ix.	II Chuen.	X Lamat.
	XIII Ezanab.	VIII Men.	III Eb.	XI Muluc.
	VIII	VIII	VIII	VIII
	17? (18)[1]	17	17	17

[1] The variation from the rule found here is explained a little further on.

TABLE VIII.—*Table of numeral and day symbols.* (Plate 53*a*.)

		1		1	2	2
7	17	7		15	6	15
17	13	2		14 ? (19)[1]	16	13
VI Kan.	I Ymix.	VI Muluc.	[Picture.]	I Cimi.	IX Akbal.	IV Ahau.
VII Chicchan.	II Ik.	VII Oc.		II Manik.	X Kan.	V Ymix.
VIII Cimi.	III Akbal.	VIII Chuen.		III Lamat.	XI Chicchan.	VI Ik.
VIII	VIII	VII		VIII	VIII	VIII
17	17	8		17	17	17

[1] The 14 here is manifestly an error, one of the lines in the number symbol having been omitted; it should be 19.

TABLE IX.—*Table of numeral and day symbols.* (Plate 53*b*.)

	1		1	1	1
19	0		0	1	1
13	3		12	2	11
16	4		1	18	15
IV Kan.	IX Eb.	[Picture.]	IV Muluc.	XII Cimi.	VII Akbal.
V Chicchan.	X Been.		V Oc.	XIII Manik.	VIII Kan.
VI Cimi.	XI Ix.		VI Chuen.	I Lamat.	IX Chicchan.
VIII	VII		VIII	VIII	VIII
17	8		17	17	17

TABLE X.—*Table of numeral and day symbols.* (Plate 54*a*.)

3	3	4	4	5	5	6
6	15	6	15	5	10	4
11	8	5	8	19	16	4
XIII Ezanab.	VIII Men.	III Eb.	XI Muluc.	VI Cib.	I Akbal.	VI Chuen.
I Cauac.	IX Cib.	IV Been.	XII Oc.	VII Caban.	II Kan.	VII Eb.
II Ahau.	X Caban.	V Ix.	XIII Chuen.	VIII Ezanab.	III Chicchan.	VIII Been.
VIII	VIII	VIII	VIII	VIII	VIII	VII
17	17	17	17	17	17	8

TABLE XI.—*Table of numeral and day symbols.* (Plate 54*b*.)

1	1	1	1		1
2	2	3	3		4
2	11	2	9		0[1]
12	9	6	14		11
II Ahau.	X Caban.	V Ix.	X Ik.	[Picture.]	V Cauac.
III Ymix.	XI Ezanab.	VI Men.	XI Akbal.		VI Ahau.
IV Ik.	XII Cauac.	VII Cib.	XII Kan.		VII Ymix.
VIII	VIII	VIII	VII		VIII[2]
17	17	17	8		17

[1] The 0 inserted at various points in these tables denotes as usual the red, diamond shaped symbol, which apparently signifies "nought."

[2] The numeral symbol in this case, both in Kingsborough's copy and in the photograph, is VII, one dot having been omitted by a mistake of the original artist.

TABLE XII.—*Table of numeral and day symbols.* (Plate 55*a*.)

	8	7	7	8	8
	13	3	12	3	12
	2	18	16	13	10
[Picture.]	II Muluc.[1]	X Cimi.	V Akbal.	XIII Ahau.	VIII Caban.
	III Oc.	XI Manik.	VI Kan.	I Ymix.	IX Ezanab.
	IV Chuen.	XII Lamat.	VII Chicchan.	II Ik.	X Cauac.
	VIII	VIII	VIII	VIII	VIII
	17	17	17	17	17

[1] In Kingsborough's work the symbol in this case is that of Been, but should be Muluc, as it is in the photograph.

TABLE XIII.—*Table of numeral and day symbols.* (Plate 55*b*.)

1	1	1	1	1	1	1	1
4	5	5	6	6	6	7	7
9	0	9	0	8	17	8	15
8	6	3	0	17	14	11	19
XIII Cib.	IX Ix.	IV Chuen.	XII Lamat.	VII Chicchan.	II Ik.	X Cauac.	II Manik.
I Caban.	X Men.	V Eb.	XIII Muluc.	VIII Cimi.	III Akbal.	XI Ahau.	III Lamat.
II Ezanab.	XI Cib.	VI Been.	I Oc.	IX Manik.	IV Kan.	XII Ymix.	IV Muluc.
VIII	VIII	VIII	VIII	VIII	VIII	VIII	VII
17	17 ? (18)	17	17	17	17	17	8

TABLE XIV.—*Table of numeral and day symbols.* (Plate 56*a*.)

9	[Picture.]	9	10	10
1		10	1	10
18		15	12	9
XIII Chicchan.		VIII Ik.	III Cauac.	XI Cib.
I Cimi.		IX Akbal.	IV Ahau.	XII Caban.
II Manik.		X Kan.	V Ymix.	XIII Ezanab.
VII		VIII	VIII	VIII
8		17	17	17

TABLE XV.—*Table of numeral and day symbols.* (Plate 56*b*.)

[Picture.]	1	1	1	1
	8	8	9	9
	6	15	6	15
	16	14	11	8
	X Kan.	VI Ik.	I Cauac.	IX Cib.
	XI Chicchan.	VII Akbal.	II Ahau.	X Caban.
	XII Cimi.	VIII Kan.	III Ymix.	XI Ezanab.
	VIII	VIII	VIII	VIII
	17	17 ? (8)	17	17

TABLE XVI.—*Table of numeral and day symbols.* (Plate 57*a*.)

11	11	12	12	[Picture.]
1	10	1	8	
6	4	0	8	
VII Ix.	II Chuen.	X Lamat.	II Cib.	
VIII Men.	III Eb.	XI Muluc.	III Caban.	
IX Cib.	IV Been.	XII Oc.	IV Ezanab.	
VIII	VIII	VIII	VIII[1]	
17	17	17	17[2]	

[1] This should be VII. [2] This should be 8.

TABLE XVII.—*Table of numeral and day symbols.* (Plate 57*b*.)

1	1	1	[Picture.]	1	1
10	10	11		11	12
6	15	4		13	4
5	2	10		7	4
IV Been.	XII Oc.	IV Ezanab.		XII Men.	VII Eb.
V Ix.	XIII Chuen.	V Cauac.		XIII Cib.	VIII Been.
VI Men.	I Eb.	VI Ahau.		I Caban.	IX Ix.
VIII	VIII	VII		VIII	VIII
17	17	8		17	17

TABLE XVIII.—*Table of numeral and day symbols.* (Plate 58*a*.)

12	13	13	14
17	8	17	7
5	2	0	17
X Been.	V Oc.	I Lamat.	IX Chicchan.
XI Ix.	VI Chuen.	II Muluc.	X Cimi.
XII Men.	VII Eb.	III Oc.	XI Manik.
VIII	VIII	VIII	VIII
17	17	17	17

TABLE XIX.—*Table of numeral and day symbols.* (Plate 58*b*.)

1	1	
12	13	
13	3	
1	18	
II Muluc.	X Cimi.	[Picture.]
III Oc.	XI Manik.	
IV Chuen.	XII Lamat.	
VIII	VIII	
17	17	

The spaces in the lists indicate the positions of the pictures of persons and curtain-like ornaments inserted here and there, as seen in Figs. 363–370.

In order to explain this series, we commence with that portion of it found in the lower division of Plate 51 (Fig. 363).

Omitting any reference for the present to the black numbers over the day columns, we call attention first to the days and to the red numerals attached to them. Those in the division selected as an illustration are as follows:

IV Ik.	XII Cauac.	VII Cib.	II Been.	X Oc.	II Ezanab.
V Akbal.	XIII Ahau.	VIII Caban.	III Ix.	XI Chuen.	III Cauac.
VI Kan.	I Ymix.	IX Ezanab.	IV Men.	XII Eb.	IV Ahau.[1]

It will be observed that the week numbers of the days in each single column follow one another in regular arithmetical order, thus: in the first column, 4, 5, 6; in the second, 12, 13, 1; in the third, 7, 8, 9; and so on throughout the entire series. The interval, therefore, between the successive days of a column is 1; or, in other words, the days follow one another in regular order, as in the month series, so that having the first day of a column given we know at once the other two. It is apparent, therefore, that the intervals between the three correspondingly opposite days of any two associate columns are the same; that is to say, the interval between 5 Akbal and 13 Ahau, in the first two columns given above is the same as that between 4 Ik and 12 Cauac, and also as that between 6 Kan and 1 Ymix. This is also true if the attached week numbers are omitted; for instance, the interval between Ik and Cauac, counting on the list of days forming the month, is 17 days, and it is the same between Kan and Ymix. Taking the second and third columns we find here the same interval. This holds good in that part of the series above given until we reach the last two columns; here the interval between Oc and Ezanab is 8 days and it is the same between the other days of these two columns.

[1] The third symbol in the last day column of Plate 51*b* is Been in the codex; but this is an evident mistake, as shown by the order of the days, since Ahau, which has been substituted above, always follows Cauac. This may be seen by reference to the middle column of 57*b*.

This being ascertained, the next step is to determine the true interval between the first days of these columns, taking the numbers attached to them into consideration. Referring to our calendar (Table II) and (for reasons which will be given hereafter) using the Muluc column and counting from 4 Ik, as heretofore explained, we find the interval between this and 12 Cauac to be 8 months and 17 days; counting in the same way from 12 Cauac, 8 months and 17 days more bring us to 7 Cib; 8 months and 17 days more to 10 Oc. So far the intervals have been the same; but at this point we find a variation from the rule, as the interval between 10 Oc and 2 Ezanab (first of the next column) is 7 months and 8 days.

These intervals furnish the explanation of the red and black numerals below the day columns.

These numerals, as the reader will observe by reference to Fig. 363 or the written interpretation thereof in Table VI, are 8 and 17 under the first five columns, but 7 and 8 under the sixth column, the red (8 under the first five and 7 under the sixth) indicating the months and the black (17 under the first five and 8 under the sixth) the days of the intervals. This holds good throughout all that portion of the series running through the lower divisions of Plates 51 to 58, with three exceptions, which will now be pointed out.

In order to do this it will be necessary to repeat here a part of the series on Plate 51*b* and part of that on Plate 52*b*; that is, the two right hand columns of the former and the two left hand columns of the latter, between which is the singular picture shown in the *lower left hand corner* of our Fig. 364:

Plate 51*b*.			Plate 52*b*.	
X Oc.	II Ezanab.		XI Cib.	VI Been.
XI Chuen.	III Cauac.		XII Caban.	VII Ix.
XII Eb.	IV Ahau.	[Picture.]	XIII Ezanab.	VIII Men.
VIII	VII		VIII	VIII
17	8		17	17

As before stated, the interval between 10 Oc and 2 Ezanab is 7 months and 8 days, as indicated by the red and black numerals under the latter. According to the red and black numbers under the column commencing with 11 Cib, the interval between 2 Ezanab and 11 Cib should be 8 months and 17 days, the usual difference, when, in fact, as we see by counting on the calendar, it is 8 months and 18 days. That this variation cannot be attributed to a mistake on the part of the author or of the artist is evident from the fact that the interval between 11 Cib and 6 Been (first of the next column) is 8 months and 17 days and that the difference throughout the rest of the series follows the rule given; that is to say, each is 8 months and 17 days, except at two other points where this variation is found and at the regular

intervals where the difference of 7 months and 8 days occurs.[1] Precisely the same variation occurs on Plate 55*b* in passing from the first to the second column and on Plate 56*b* between columns 1 and 2.

Why these singular exceptions? It is difficult, if not impossible, for us, with our still imperfect knowledge of the calendar system formerly in vogue among the Mayas, to give a satisfactory answer to this question. But we reserve further notice of it until other parts of the series have been explained.

Reference will now be made to the three lines of black numerals immediately above the day columns. Still confining our examinations to the lower divisions, the reader's attention is directed to these lines, as given in Tables VI, VII, IX, XI, XIII, XV, XVII, and XIX. As there are three numbers in each short column we take for granted, judging by what has been shown in regard to the series on Plates 46–50, that the lowest of the three denotes days, the middle months, and the upper years, and that the intervals are the same between these columns as between the day columns under them. The correctness of this supposition is shown by the following additions: Starting with the first or left hand column on Plate 51*b*, we add successively the differences indicated by the corresponding red and black numbers under the day columns. If this gives in each case (save the two or three exceptions heretofore referred to) the numbers in the next column to the right throughout the series, the demonstration will be complete.

Years.	Months.	Day.	
14	16	14	First column on Plate 51*b*.
	8	17	
15	7	11	Second column on Plate 51*b*.
	8	17	
15	16	8	Third column on Plate 51*b*.
	8	17	
16	7	5	Fourth column on Plate 51*b*.
	8	17	
16	16	2	Fifth column on Plate 51*b*.
	7	8	
17	5	10	Sixth column on Plate 51*b*.
	8	18[1]	
17	14	8	First column on Plate 52*b*.
	8	17	
18	5	5	Second column on Plate 52*b*.
	8	17	

[1] This is one of the exceptional cases.

Years.	Months.	Days.	
18	14	2	Third column on Plate 52*b*.
	8	17	
—	—	—	
19	4	19	Fourth column on Plate 52*b*.
	8	17	
—	—	—	
19	13	16	First column on Plate 53*b*.
	7	8	
—	—	—	
20	3	4	Second column on Plate 53*b*.

At this point in the original, instead of 20 in the year series, we find a diamond shaped symbol, represented by 0 in our tables, with one black dot over it. From this it would seem that when this codex was written the Maya method of counting years was by periods of 20 each, as in the case of the month days. Whether there is any reference here to the ahaues is uncertain. I am inclined to think with Dr. Förstemann that it was rather in consequence of the use of the vigesimal system in representing numbers. It would have been very inconvenient and cumbersome to represent high numbers by means of dots and lines; hence a more practicable method was devised. It is evident, from the picture inserted at this point in the series, that some important chronological event is indicated. Here also in the written characters over this picture is the symbol for 20. The last number given in the above addition may therefore, in order to correspond with the method of the codex, be written as follows:

Twenty year periods.	Years.	Months.	Days.
1	0	3	4

Continuing the addition in this way the result is as follows:

Twenty year periods.	Years.	Months.	Days.	
1	0	3	4	
		8	17	
—	—	—	—	
1	0	12	1	Third column on Plate 53*b*.
		8	17	
—	—	—	—	
1	1	2	18	Fourth column on Plate 53*b*.
		8	17	
—	—	—	—	
1	1	11	15	Fifth column on Plate 53*b*.
		8	17	
—	—	—	—	
1	2	2	12	First column on Plate 54*b*.
		8	17	
—	—	—	—	
1	2	11	9	Second column on Plate 54*b*.
		8	17	
—	—	—	—	
1	3	2	6	Third column on Plate 54*b*.
		7	8	
—	—	—	—	
1	3	9	14	Fourth column on Plate 54*b*.
		8	17	
—	—	—	—	

Twenty year periods.	Years.	Months.	Days.	
1	4	0	11	Fifth column on Plate 54*b*.
		8	17	
—	—	—	—	
1	4	9	8	First column on Plate 55*b*.
		8	18[1]	
—	—	—	—	
1	5	0	6	Second column on Plate 55*b*.
		8	17	
—	—	—	—	
1	5	9	3	Third column on Plate 55*b*.
		8	17	
—	—	—	—	
1	6	0	0	Fourth column on Plate 55*b*.
		8	17	
—	—	—	—	
1	6	8	17	Fifth column on Plate 55*b*.
		8	17	
—	—	—	—	
1	6	17	14	Sixth column on Plate 55*b*.
		8	17	
—	—	—	—	
1	7	8	11	Seventh column on Plate 55*b*.
		7	8	
—	—	—	—	
1	7	15	19	Eighth column on Plate 55*b*.
		8	17	
—	—	—	—	
1	8	6	16	First column on Plate 56*b*.
		8	18[2]	
—	—	—	—	
1	8	15	14	Second column on Plate 56*b*.
		8	17	
—	—	—	—	
1	9	6	11	Third column on Plate 56*b*.
		8	17	
—	—	—	—	
1	9	15	8	Fourth column on Plate 56*b*.
		8	17	
—	—	—	—	
1	10	6	5	First column on Plate 57*b*.
		8	17	
—	—	—	—	
1	10	15	2	Second column on Plate 57*b*.
		7	8	
—	—	—	—	
1	11	4	10	Third column on Plate 57*b*
		8	17	
—	—	—	—	
1	11	13	7	Fourth column on Plate 57*b*.
		8	17	
—	—	—	—	
1	12	4	4	Fifth column on Plate 57*b*.
		8	17	
—	—	—	—	
1	12	13	1	First column on Plate 58*b*.
		8	17	
—	—	—	—	
1	13	3	18	Second column on Plate 58*b*.

[1] Second exception.

[2] Third exception.

The proof, therefore, that the theory advanced in regard to the order and the plan of the series is correct seems to be conclusive. This probably would have been conceded without the repeated additions given, but these were deemed necessary because of several irregularities found in that portion running through Plates 53*a*–58*a*, which constitutes the first half of the series.

Turning back to our Table VIII, representing that part of the series on Plate 53*a*, we will consider the three lines of black numerals above the day columns, discussing the irregularities as we proceed.

The numbers in the first column are $_{1}^{7}{}_{7}$, or, according to the explanation given, 7 months and 17 days. There is apparently a mistake here, the correct numbers being 8 months and 17 days, as it is the usual custom of the codex to commence numeral series with the prevailing interval; moreover this correction, which has also been made by Dr. Förstemann, is necessary in order to connect rightly with what follows; the counters under this first column require this correction, as they are 8 months, 17 days. Making this change we proceed with the addition.

Years.	Months.	Days.	
	8	17	First column, Plate 53*a* (corrected).
	8	17	
	17	14	Second column, Plate 53*a*.

Here the author of the codex has made another mistake or varied from the plan of the series. As several similar variations or errors occur in this part of the series, it will be as well to discuss the point here as elsewhere. Dr. Förstemann, in discussing the series, takes it for granted that these variations are errors of the aboriginal scribe; he remarks that "It is seen here that the writer has corrected several of his mistakes by compensation. For instance, the two first differences should be 177 [8 months, 17 days] and 148 [7 months, 8 days], not 176 and 149," &c.

This is a strained hypothesis which I hesitate to adopt so long as any other solution of the difficulty can be found. It is more likely that the writer would have corrected his mistakes, if observed, than that he would compensate them by corresponding errors.

Going back to that part of the series in the lower divisions which has already been examined and commencing with Plate 51*b* (see Table VI), we observe that the numbers in the lowest of the three lines of black numerals, immediately over the day columns, and the first day of these columns are as follows (omitting the week days attached):

14	11	8	5	2	10
Ik.	Cauac.	Cib.	Been.	Oc.	Ezanab.

Turning to the calendar (Table II) and using the Muluc column, we notice that the figures of this third line of black numerals denote respectively the month numbers of the days under them; that is to

say, Ik is the fourteenth day of the month in Muluc years, Cauac the eleventh, Cib the eighth, Been the fifth, Oc the second, and Ezanab the tenth. This holds good through Plates 52*b* to 58*b* without a single exception, provided the diamond shaped symbol in the fourth column of Plate 55*b* is counted as 20. This test, therefore, presents fewer exceptions than are found in counting the intervals as before explained; yet, after all, this would necessarily result from the fact that the day Muluc was selected as the commencement of the series, and hence may have no signification in reference to or bearing on the question of the year series, especially as the years counted are evidently of 360 days.

Returning now to our Table VIII, representing Plate 53*a*, we observe that the number immediately over Kan in the first column is 17, whereas Kan is the sixteenth day of the month. Is it not possible that the intention was to designate as the ceremonial day Chicchan, standing immediately below, which is the seventeenth day of the month in Muluc years? Even though there is no reference to Muluc years, the intervals may be given upon the same idea, that of reaching, for some particular reason, the second or third day of the column instead of the first. This would account for the compensation of which Dr. Förstemann speaks, without implying any mistake on the part of the writer. These irregularities would then be intentional variations from the order of the series, yet so as not to break the general plan.

The interval between 6 Kan of the first column (with the month number corrected) and 1 Ymix of the second is 8 months and 17 days, as it should be; between 6 Muluc and 1 Cimi, 8 months and 17 days; and between 1 Cimi and 9 Akbal, 8 months and 17 days, thus conforming to the rule heretofore given, a fact which holds good as a general rule throughout that portion of the series in the upper division.

Continuing the addition as heretofore we note the variations.

Years.	Months.	Days.	Column.	Plate.
	17	14	Second.	53*a*.
	7	8		
—	—	—		
1	7	2	Third.	53*a*.
	8	17		
—	—	—		
1	15	19[1]	Fourth.	53*a*.
	8	17		
—	—	—		
2	6	16	Fifth.	53*a*.
	8	17		
—	—	—		
2	15	13	Sixth.	53*a*.
	8	18[2]		
—	—	—		

[1] One line has been omitted in the numeral symbol.

[2] Here we have again the added day.

Years.	Months.	Days.	Column.	Plate.
3	6	11	First.	54*a*.
	8	17		
—	—	—		
3	15	8	Second.	54*a*.
	8	17		
—	—	—		
4	6	5	Third.	54*a*.
	8	17		
—	—	—		
4	15	2[1]	Fourth.	54*a*.
	8	17		
—	—	—		
5	5	19	Fifth.	54*a*.
	8	17		
—	—	—		
5	14[2]	16	Sixth.	54*a*.
	7	8		
—	—	—		
6	4	4	Seventh.	54*a*.
	8	18[3]		
—	—	—		
6[4]	13	2	First.	55*a*.
	8	17		
—	—	—		
7	3	19[5]	Second.	55*a*.
	8	17		
—	—	—		
7	12	16	Third.	55*a*.
	8	17		
—	—	—		
8	3	13	Fourth.	55*a*.
	8	17		
—	—	—		
8	12	10	Fifth.	55*a*.
	7	8		
—	—	—		
9	1	18	First.	56*a*.
	8	17		
—	—	—		
9	10	15	Second.	56*a*.
	8	17		
—	—	—		
10	1	12	Third.	56*a*.
	8	17		
—	—	—		
10	10	9	Fourth.	56*a*.
	8	17		
—	—	—		
11	1	6	First.	57*a*.
	8	17		
—	—	—		

[1] The 8 at this point in the codex is an evident error.

[2] Here is also an error in the original, this being 10.

[3] The symbols require an additional day here.

[4] The 8 in the year line in the original is a manifest error, as 6 precedes and 7 follows.

[5] The 18 in the day line at this point is also an error, as the interval between 2 Muluc and 10 Cimi is 8 months and 17 days. Moreover, the next day number being 16 requires this to be 19.

Years.	Months.	Days.	Column.	Plate.
11	10	3	Second.	57*a*.
	8	17		
—	—	—		
12	1	0	Third.	57*a*.
	7	8[1]		
—	—	—		
12	8	8	Fourth.	57*a*.
	8	17		
—	—	—		
12	17	5	First.	58*a*.
	8	17		
—	—	—		
13	8	2	Second.	58*a*.
	8	18[2]		
—	—	—		
13	17	0	Third.	58*a*.
	8	17		
—	—	—		
14	7	17	Fourth.	58*a*.
	8	17		
—	—	—		
14	16	14	First.	51*b*.[3]

We have in what has thus far been given a satisfactory explanation of the meaning and use of the lines of numerals and also of their relation to the day columns, but we still fall short of a complete interpretation, inasmuch as we are unable to give the series a definite location in the Maya calendar or in actual time. It is apparent, however, that the series cannot by any possible explanation be made to agree with the calendar system as usually accepted, as there is nothing in it indicating the four series of years or the year of 365 days. It may be safely assumed, I think, from what has been shown, that the year referred to in the series is one of 360 days, with probably a periodic addition of one day, but the reason of the addition is not yet apparent.

If the numbers in the lowest line of numerals over the day columns indicate the days of the month, and those of the middle line the respective months of the year, it is evident, as before stated, that Muluc is the first day of the year throughout, a conclusion irreconcilable with the Maya calendar as hitherto understood. It is probable, however, that the month and day numbers do not refer to particular months and days, but are used only as intervals of time counted from a certain day, which must in this case have been Muluc.

The sum of the series as shown by the numbers over the second column of Plate 58*b* is 33 years, 3 months, and 18 days. As this includes only the top day of this column (10 Cimi), we must add two days to complete the series, which ends with 12 Lamat. This makes

[1] The counters in the original at this point are certainly wrong, for here should be 7 months and 8 days, whereas the symbols are those for 8 months and 17 days.

[2] Here we have again the additional day.

[3] Added to show connection with the lower series.

the sum of the entire series 33 years, 4 months, or 11,960 days, precisely 46 cycles of 13 months, or 260 days each, the whole and also each cycle commencing with 13 Muluc and ending with 12 Lamat. It is also worthy of notice that in the right hand column of characters (hieroglyphics) over the inverted figure in Plate 58*b* two numbers, 13 and 12, are found attached to characters which appear to be abnormal forms of month symbols.

On Plates 63 and 64 are three series of ten day columns each and three lines of numerals over each series. These are as follows, so far as they can be made out, the numbers over the upper series being mostly obliterated. The 0 denotes the red, diamond shaped symbol which is here sometimes given in fanciful forms.

TABLE XX.—*Table showing series of day columns, with lines of numerals.*

UPPER DIVISION.

Plate 63.			Plate 64.						
4 8 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	3 6 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal	0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	0 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	0 16 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	0 12 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	0 8 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	3 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	3 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.

MIDDLE DIVISION.

XIX 5 IV 1 IV 0 III Chicchan. Kan. Ix. Cimi. XIII Akbal.	4 14 9 III Ix. Been. Akbal. Men. XIII Eb.	4 9 18 III Akbal. Ik. Eb. Kan. XIII Ymix.	4 5 7 III Eb. Chuen. Ymix. Been. XIII Oc.	4 0 16 III Ymix. Ahau. Oc. Ik. XIII Cauac.	3 14 5 III Oc. Muluc. Cauac. Chuen. XIII Lamat.	3 9 14 III Cauac. Ezanab. Lamat. Ahau. XIII Caban.	3 5 3 III Lamat. Manik. Caban. Muluc. XIII Cimi.	3 0 12 III Caban. Cib. Cimi. Ezanab. XIII Men.	2 14 1 III Cimi. Chicchan. Men. Manik. XIII Kan.

LOWER DIVISION.

2 9 10 III Men. Ix. Kan. Cib. XIII Been.	2 4 19 III Kan. Akbal. Been. Chicchan. XIII Ik.	2 0 8 III Been. Eb. Ik. Ix. XIII Chuen.	1 13 17 III Ik. Ymix. Chuen. Akbal. XIII Ahau.	1 9 6 III Chuen. Oc. Ahau. Eb. XIII Muluc.	1 4 15 III Ahau. Cauac. Muluc. Ymix. XIII Ezanab.	1 0 4 III Muluc. Lamat. Ezanab. Oc. XIII Manik.	13 13 III Ezanab. Caban. Manik. Cauac. XIII Cib.	9 2 III Manik. Cimi. Cib. Lamat. XIII Chicchan.	4 11 III Cib. Men. Chicchan. Caban. XIII Ix.

By examining carefully the lines and columns of the middle and lower divisions of the plates — those represented in Tables XXI and XXII — we ascertain that the two together form one series; but, contrary to the method which has prevailed in those examined, it is to be read from *right* to *left*, commencing with the right hand column of the lower and ending with the left hand column of the middle division.

As proof of this we have only to note the fact that the series of black numerals over the day columns ascends towards the left. Assuming the lowest of the three lines to be days, the middle one months, and the upper one years, the common difference is 4 months and 11 days. Numbering the ten columns of each of our tables from left to right as usual and adding successively the common difference, commencing with the tenth column of the lowest division, of which Cib is the first day, the result will be as follows:

Years.	Months.	Days.	
	4	11	Over tenth column, lower division.
	4	11	
	9	2	Over ninth column, lower division.
	4	11	
	13	13	Over eighth column, lower division.
	4	11	
1	0	4	Over seventh column, lower division.
	4	11	
1	4	15	Over sixth column, lower division.
	4	11	
1	9	6	Over fifth column, lower division.
	4	11	
1	13	17	Over fourth column, lower division.
	4	11	
2	0	8	Over third column, lower division.
	4	11	
2	4	19	Over second column, lower division.
	4	11	
2	9	10	Over first column, lower division.
	4	11	
2	14	1	Over tenth column, middle division.
	4	11	
3	0	12	Over ninth column, middle division.
	4	11	
3	5	3	Over eighth column, middle division.
	4	11	

Years.	Months.	Days.	
3	9	14	Over seventh column, middle division.
	4	11	
3	14	5	Over sixth column, middle division.
	4	11	
4	0	16	Over fifth column, middle division.
	4	11	
4	5	7	Over fourth column, middle division.
	4	11	
4	9	18	Over third column, middle division.
	4	11	
4	14	9	Over second column, middle division.
	4	11	
5	1	0	Over first column, middle division.

The red numerals over the first column of the middle division, except the lowest diamond shaped one, are omitted, as they do not appear to belong to the series.

It must be borne in mind that the 4 months and 11 days form the common difference between the corresponding days of the columns counting from right to left; that is to say, counting 4 months and 11 days from the top day of any column will bring us to the first or top day of the next column to the left. The interval between the other corresponding days of the columns is also the same if the same week numbers are assigned them.

This question arises here, Does the difference include the time embraced in the entire column? That is to say, Is this interval of 4 months and 11 days (referring, for example, to the tenth and ninth columns of the lower division, our table) the sum of the intervals between 3 Cib and Men; Men and Chicchan; Chicchan and Caban; Caban and 13 Ix, and 13 Ix of the tenth column and 3 Manik of the ninth column? If not, the columns do not form a continuous series or must be taken in some other order.

Although Dr. Förstemann discovered the order in which the series as a whole was to be read, and also the common difference — given, as is his custom, in days — he failed to furnish further explanation of the group.

In answer to the question presented I call attention to the following facts:

Commencing again with the uppermost day, 3 Cib, of the tenth column, lowest division, and counting on the calendar to 13 Ix of the same year, the interval is found to be 10 months and 18 days, which is much more than the interval between 3 Cib and 3 Manik (first of the ninth column), and of course cannot be included in it.

Reversing the order in reading the columns, but counting forward

on the calendar as usual, we find the interval between 13 Ix and 3 Cib to be 2 months and 2 days, and, what is another necessary condition, the intermediate days of the column are included in this period in the order in which they stand, if read upwards. The interval between 3 Cib, uppermost day of the tenth column, and 13 Chicchan, bottom day of the ninth column, is 2 months and 9 days. The sum of these two intervals is 4 months and 11 days, as it should be on the supposition that the entire columns follow one another in regular succession. This proves beyond question that the columns are to be read from *bottom* to *top* and that they follow one another from *right* to *left*. This enables us to fix the week numbers to the intermediate days and to determine the day to which the entire series is referred as its starting point. The days and their numbers of the tenth and ninth columns of the lower division, writing them in reverse order, that is, from bottom to top, are as follows: 13 Ix; 3 Caban; 11 Chicchan; 8 Men; 3 Cib; 13 Chicchan; 3 Lamat; 11 Cib; 8 Cimi; 3 Manik.

These numbers hold good throughout the series.

Commencing with 13 Ix, the lowest day of the tenth column, lower division, but first day of the series, and ending with 13 Akbal, the bottom of the first column, middle series, the time embraced is 5 years, 1 month, 0 day, less 4 months and 11 days—that is, 4 years, 14 months, 9 days (years of 360 days being understood). This is easily proved by counting on the calendar 4 years, 14 months, and 9 days from 13 Ix, as it brings us to 13 Akbal. If we add to this time 2 months and 2 days—the interval between 13 Akbal and 3 Chicchan (top day of first column, middle division)—we have, as the entire period embraced in the series as it stands—from 13 Ix (first of the series) to 3 Chicchan (the last)—4 years, 16 months, 11 days. Add to this 4 months and 11 days, in order to reach the day with which the count begins, and we have as the entire period 5 years, 3 months, 2 days=5 years, 1 month, 0 day + 2 months, 2 days. If we count back 4 months and 11 days from 13 Ix (first of the series), we reach 1 Kan, the day to which the series is referred as its starting point. Counting forward from this date 5 years, 3 months and 2 days brings us to 3 Chicchan, the last day of the series.

It is worthy of notice that, although this series appears to be referred to Kan years, it is at variance with the idea of passing from one to the other of the four year series, and is, moreover, based upon the year of 360 days. The order in which it is to be read, which is true also of some other pages, indicates that these extracts pertain to a different original codex than those to which we have heretofore alluded, a conclusion reached by Dr. Förstemann soon after he commenced the study of the Dresden manuscript.

I was for a time inclined to believe there was a break between Plates 64 and 65, as there appeared to be no day columns with which

the lines of numerals running through Plates 65–69 could be connected, but the fact that the sum of the black numbers in each is 91, precisely the interval between the corresponding days of the columns in Plates 63 and 64, will probably warrant the conclusion that they are connected with them. This conclusion is strengthened, so far as those in the lower division are concerned, by the fact that by taking the XIII attached to the lowest days of the columns the numbers properly succeed one another and the series conforms to the rule heretofore given. As proof of this I give here the lower line of the lower division, prefixing the XIII, thus: XIII; 9, IX; 5, I; 1, II; 10, XII; 6, V; 2, VII; 11, V; 7, XII; 3, II; 12, I; 8, IX; 4, XIII; 13, XIII.

Adding together the numbers and casting out the thirteens, thus, XIII+9−13=IX; IX+5−13=I, &c., the connection is seen to be regular. The final red numeral is XIII, the same as that with which the series begins, and the sum of the black numbers, 9, 5, 1, 10, 6, 2, 11, 7, 3, 12, 8, 4, 13, is 91, a multiple of 13. The middle line of numerals also connects with the XIII attached to the bottom symbols of the day columns; and the upper line of numerals connects with the III attached to the top symbols of the day columns.

Plates 70 to 73 present some peculiarities difficult to account for. That these pages belong to the same type as 62, 63, and 64 cannot be doubted, and that as a general rule they are to be read from right to left is easily proved; but this method does not seem to be adopted throughout, the order being apparently reversed in a single series.

The aboriginal artist has apparently made up these pages from two older manuscripts or changed and added to his original. The last two columns of Plate 70 and first five of 71 appear to have been thrust in here as an afterthought or as a fragment from some other source, forming apparently no legitimate connection with the series to either the right or to the left of them. It is true, as will be shown, that there is some connection with the lowest series on the right, but it would seem that advantage was here taken of accidental correspondence rather than that this correspondence was the result of a preconceived plan.

Commencing in the lower part of the middle division of Plate 73 and running back (to the left) to the sixth column of 71 and returning to the lower part of the lower division of 73 and ending with the sixth column of 71, is the following series. The columns are given in the order in which they stand on the respective plates, but the plates are taken in reverse order:

TABLE XXIII.—*Table giving comparison between Plates 71, 72, and 73.*

	First column.	Second column.	Third column.	Fourth column.	Fifth column.		
Plate 73, middle division.	16	13	9	6	3	.....	.....
	5	0	15	10	5	.....	.....
	IV Caban.	IV Eb.	IV Manik.	IV Ik.	IV Caban.	.....	.....

	First column.	Second column.	Third column.	Fourth column.	Fifth column.	Sixth column.	Seventh column.
Plate 72, middle division.	2	1	1	1	1	1	.....
	3	17	14	11	8	4	19
	0	15	10	5	0	15	10
	IV Eb.	IV Manik.	IV Ik.	IV Caban.	IV Eb.	IV Manik.	IV Ik.

						Sixth column.	Seventh column.
Plate 71, middle division.	.....	.....	.....	.....	.....	2	2
	.....	.....	.....	.....	.....	9	6
	.....	.....	.....	.....	.....	10	5
	.....	.....	.....	.....	.....	IV Ik.	IV Caban.

	First column.	Second column.	Third column.	Fourth column.	Fifth column.		
Plate 73, lower division.	3	3	3	2	2	.....	.....
	7	3	1	16	12	.....	.....
	15	10	5	0	15	.....	.....
	IV Manik.	IV Ik.	IV Caban.	IV Eb.	IV Manik.	.....	.....

	First column.	Second column.	Third column.	Fourth column.	Fifth column.	Sixth column.	Seventh column.
Plate 72, lower division.	4	4	4	4	3	3	3
	12	9	6	2	17	14	11
	10	5	0	15	10	5	0
	IV Ik.	IV Caban.	IV Eb.	IV Manik.	IV Ik.	IV Caban.	IV Eb.

						Sixth column.	Seventh column.
Plate 71, lower division.	.....	.....	.....	.....	.....	5	4
	.....	.....	.....	.....	.....	1	15
	.....	.....	.....	.....	.....	0	15
	.....	.....	.....	.....	.....	IV Eb.	IV Manik.

The interval between the successive days, counting to the left, is in each case 3 months and 5 days, corresponding with the numbers over IV Caban, fifth column, middle division, Plate 73. Com-

mencing with this number and adding it successively, we obtain the numbers over the various columns:

Years.	Months.	Days.	
	3	5	Over fifth column, middle division, Plate 73.
	3	5	
	6	10	Over fourth column, middle division, Plate 73.
	3	5	
	9	15	Over third column, middle division, Plate 73.
	3	5	
	13	0	Over second column, middle division, Plate 73.
	3	5	
	16	5	Over first column, middle division, Plate 73.
	3	5	
1	1[1]	10	Over seventh column, middle division, Plate 72.
	3	5	
1	4	15	Over sixth column, middle division, Plate 72.
	3	5	
1	8	0	Over fifth column, middle division, Plate 72.
	3	5	
1	11	5	Over fourth column, middle division, Plate 72.
	3	5	
1	14	10	Over third column, middle division, Plate 72.
	3	5	
1	17	15	Over second column, middle division, Plate 72.
	3	5	
2	3	0	Over first column, middle division, Plate 72.
	3	5	
2	6	5	Over seventh column, middle division, Plate 71.
	3	5	
2	9	10	Over sixth column, middle division, Plate 71.
	3	5	
2	12	15	Over fifth column, lower division, Plate 73.
	3	5	
2	16	0	Over fourth column, lower division, Plate 73.
	3	5	
3	1	5	Over third column, lower division, Plate 73.
	3	5	
3	4	10	Over second column, lower division, Plate 73.
	3	5	
3	7	15	Over first column, lower division, Plate 73.
	3	5	

[1] Codex has 19, which is equivalent to 1 year and 1 month.

Years.	Months.	Days.	
3	11	0	Over seventh column, lower division, Plate 72.
	3	5	
3	14	5	Over sixth column, lower division, Plate 72.
	3	5	
3	17	10	Over fifth column, lower division, Plate 72.
	3	5	
4	2	15	Over fourth column, lower division, Plate 72.
	3	5	
4	6	0	Over third column, lower division, Plate 72.
	3	5	
4	9	5	Over second column, lower division, Plate 72.
	3	5	
4	12	10	Over first column, lower division, Plate 72.
	3	5	
4	15	15	Over seventh column, lower division, Plate 71.
	3	5	
5	1	0	Over sixth column, lower division, Plate 71.

It is worthy of notice that the sum of the series as expressed by the final numbers is precisely that of the series on the middle and lower divisions of Plates 63 and 64, heretofore given, and embraces seven complete cycles of 13 months, or 260 days each. Counting back three months and five days from 4 Caban (the day in the fifth column, middle division, of Plate 73) we reach 5 Been as the starting point of the series.

As there can be no doubt that the lines and days of the two divisions form together one unbroken series, it is evident there is no connection between that portion of it in the middle division and what lies to the left of it in Plate 71; but there does appear to be, as before indicated, some connection between the conclusion and what follows to the left in the lower portion of 71. The series which lies to the left at this point is as follows:

TABLE XXIV.—*Table showing relations of Plates* 70 *and* 71.

Plate 70.		Plate 71.					
5th column.	6th column	1st column.	2d column.	3d column.	4th column.	5th column.	6th column.
6	5	4	3	2			
1	1	0	0	0	15	10	5
6	2	16	12	8	3	2	1
0	0	0	0	0	0	0	0
IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.

For the purpose of assisting the reader to see the relation more clearly, the last column of the preceding series—sixth of the lower division on Plate 71—is added at the right as it stands in the original.

It is apparent that the figures in the fifth column of 71 are exactly double those in the sixth column. This and the fact that the day IV Eb is the same as those following are the only indications that there is any connection between the series. Using the 5 years and 1 month as the common difference and adding, the result is as follows:

Years.	Months.	Days.	
5	1	0	Sixth column, lower division, Plate 71.
5	1	0	
—	—	—	
10	2	0	Fifth column, lower division, Plate 71.
5	1	0	
—	—	—	
15	3	0	Fourth column, lower division, Plate 71.

At this point another change occurs: the former difference is added to the last figures and the sum is doubled.

Twenty year periods.	Years.	Months.	Days.	
	15	3	0	
	5	1	0	
	—	—	—	
1	0	4	0	
			2	
—	—	—	—	
2	0	8	0	Third column lower division, Plate 71.
1	0	4	0	
—	—	—	—	
3	0	12	0	Second column, lower division, Plate 71.
1	0	4	0	
—	—	—	—	
4	0	16	0	First column, lower division, Plate 71.
1	0	4	0	
—	—	—	—	
5	1	2	0	Sixth column, lower division, Plate 70.
1	0	4	0	
—	—	—	—	
6	1	6	0	Fifth column, lower division, Plate 70.

This series does not end at this point, but is continued in the lines immediately above, which are as follows:

TABLE XXV.—*Table showing relations between Plates* 70 *and* 71.

Plate 70.		Plate 71.				
5th column.	6th column.	1st column.	2d column.	3d column.	4th column.	5th column.
1						
0	8(?)	15	13	10	9	7
				XII		
12	1	3	2	2	2	1
				II		
3	10	6	16	4	0	10
				XII		
0	0	0	0	(?)	0	0
IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.	IV Eb.

Adding the difference, 1, 0, 4, 0, to the final result of the preceding addition we obtain the figures of the right hand column (fifth column, Plate 71) of this series:

6	1	6	0
1	0	4	0
7	1	10	0

To obtain the figures of the fourth column this difference must be doubled, thus:

7	1	10	0
2	0	8	0
9	2	0	0

To obtain the black numbers of the next (third) column, the lower cipher symbol of which is wanting, we add the former difference:

9	2	0	0
1	0	4	0
10	2	4	0

This decrease in the difference is unusual and indicates some error. This idea seems to be confirmed in the following way: In order to obtain the numbers of the next (second) column it is necessary to add three times the former difference, thus:

10	2	4	0	
3	0	12	0	
13	2	16	0	Second column, Plate 71.

If the increased difference, 2, 0, 8, 0, were retained after its appearance the result would be as follows:

7	1	10	0	Fifth column, Plate 71.
2	0	8	0	
9	2	0	0	Fourth column, Plate 71.
2	0	8	0	
11	2	8	0	Third column, Plate 71.
2	0	8	0	
13	2	16	0	Second column, Plate 71.
2	0	8	0	
15	3	6	0	First column, Plate 71.

Adding the difference, 2, 0, 8, 0, to the third column, Plate 71, thus:

10	2	4	0
2	0	8	0
12	2	12	0

we obtain the red numerals inserted in the third column. It is probable that the original or some subsequent scribe, observing an error at

this point, inserted these figures as a correction. If so, he failed to remedy the confusion apparent in this portion of the series. The sum of the entire series is 303 years (360 days each) and six months, equal to 420 cycles of 260 days.

I am strongly inclined to believe that this section and also pages 24 and 59 are interpolations by some aboriginal artist of a mathematical turn and advanced ability in this direction, who has given these high series more as curiosities than with reference to any specific dates or periods of time.

Commencing in the sixth column of Plate 71*a* and running through 72*a* to the second column of 73*a*, is a numeral series which presents some peculiarities that baffle all attempts at explanation. Contrary to the rule which prevails in these pages it ascends from left to right and has no day symbols connected with it. In addition to this, the numbers of its lowest line are inclosed in loops of the form here shown (Fig. 371) and have no apparent connection with the other

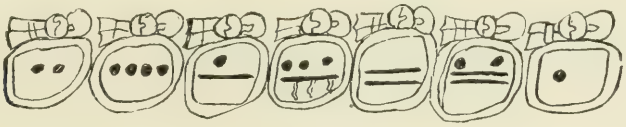


FIG. 371. Specimens of ornamental loops from page 72, Dresden Codex.

lines of the series, but, on the contrary, if taken from right to left, they present in the order usually given the numbers of the ahaues or katunes.[1] It is as follows:

						1	1	1	1	1	1	1	
2	5	8	10	13	16	0	3	6	9	11	14	17	
													II.
14	8	2	16	10	4	18	12	6	0	14	7(?)	2	XIV
(11)	(13)	(2)	(4)	(6)	(8)	(10)	(12)	(1)	(3)	(5)	(7)	(9)	

The last (thirteenth) column of this series is not in a line with the others, but is found in the lower part of the right hand column of Plate 73, and in connection with it we find the red numerals II and

[1] While reading the final proof I fortunately discovered what may prove to be the correct explanation of the numbers in the loops.

At the commencement of the series on Plate 71 and at its close on Plate 73 we observe the symbol of the day, 9 Ix. Starting from this date and counting forward on the calendar two months and fourteen days, we reach 11 Lamat. This gives the number in the first loop of the series. Two months and fourteen days more bring us to 13 Ik, the number in the second loop; two months and fourteen days to 2 Cib, the number in the third loop, and so on to the end. It is therefore probable that the numerals in the loops indicate the week numbers of the days, though these are usually expressed in red symbols.

XIV, denoting the difference between the columns, as is apparent from the additions here given:

Years.	Months.	Days.	
	2	14	First or left hand column.
	2	14	
	5	8	Second column.
	2	14	
	8	2	Third column.
	2	14	
	10	16	Fourth column.
	2	14	
	13	10	Fifth column.
	2	14	
	16	4	Sixth column
	2	14	
1	0	18	Seventh column.
	2	14	
1	3	12	Eighth column.
	2	14	
1	6	6	Ninth column.
	2	14	
1	9	0	Tenth column.
	2	14	
1	11	14	Eleventh column.
	2	14	
1	14	8	Twelfth column.
	2	14	
1	17	2	Thirteenth column.

[1] The 7 in the twelfth column is an error; it should be 8, as an inspection shows the place of the missing dot. The additions make it clear that the numbers of the second line refer to months, those of the line below them to days, and those of the line above to years. The series is, therefore, apparently complete without the numbers inclosed in the loops.

CHAPTER II.

CONCLUSIONS.

The conclusions to be drawn from the foregoing discussion may be briefly stated as follows:

First. That the codex in its present form is composite, being made up from two or more different original manuscripts, as Dr. Förstemann has suggested.

Second. That a number of minor changes and additions have been made by a subsequent hand, possibly after it had assumed its present form.

Third. That the year referred to in the larger series is one of 360 days; also, that in instances of this kind the count is continuous, and hence not consistent with the generally received idea of the Maya calendar, in which the four year series forms a necessary part of the system, unless some other method of accounting for the five supplemental days can be discovered than that which has hitherto been accepted.

Fourth. On the other hand, indications of the four year series are certainly found in all of the Maya manuscripts; for example, in Plates 25–28 of the Dresden Codex and Plates XX–XXIII of the Manuscript Troano,[1] which seem to be based on this series; in fact, the numbers attached to the days in the latter can be accounted for in no other way. Plates 3–6 of the Cortesian Codex are apparently based upon the same system. The numbers in the loops on Plates 71, 72, and 73, Dresden Codex, heretofore alluded to and represented in Fig. 371, apparently defy explanation on any supposition except that they refer to the numbers of the ahaues, which are based upon the four year series.[2] The frequent occurrence in connection and in proper order of both the first and the terminal days of the year apparently refers to the same system. Many of the quadruple series no doubt relate to the four cardinal points and the four seasons; yet there are some which cannot be explained on this theory alone.

It is impossible, therefore, to exclude this system from consideration in studying the chronology of the codices, although there are a number of the numerical series of the Dresden manuscript which cannot be made to fit into it on any hypothesis so far suggested. The same thing is also found to be true in regard to some, in fact most, of the series found in the Mexican manuscripts. This confusion probably arises in part from the apparently well established fact that two

[1] See Study of the Manuscript Troano, by Cyrus Thomas.

[2] See note on page 337.

methods of counting time prevailed among both Mexicans and Mayas: one, the solar year in ordinary use among the people, which may be termed the vulgar or common calendar; the other, the religious calendar used by the priests alone in arranging their feasts and ceremonies, in which the cycle of 260 days was taken as the basis. But this supposition will not suffice as an explanation of some of the long series of the Dresden Codex, in which the year of 360 days appears to have been taken as a unit of measure, unless we assume—as Förstemann seems to have done—that what have been taken as years are simply high units and, counting the whole as so many days, refer the sum to the cycle of 260 days, which will in almost every case measure them evenly as a whole, or by its leading factor, 13. That the smaller series attached to day columns are all multiples of 13 and referable to the cycle of 260 days has been shown by Förstemann as well as in the preceding part of this paper. But it is worthy of note that the difficulty mentioned occurs only in reference to series found in that portion of the Dresden manuscript which Förstemann has designated Codex B (page 24 being considered as belonging thereto).

The red unit number symbol, with a circle of dots around it, seen occasionally in the Manuscript Troano, seems to have some connection with the four year series. Take, for example, the one in the lowest division of Plate VII.

The series commences in the lower right hand corner of Plate VIII, where the day column with which it is connected is found. The days of this column, reading downward, are as follows: Ahau, Eb, Kan, Cib, Lamat, and the number over them is I, but without any dots around it, while the terminal I of the series is inclosed in the circle of dots. What is the meaning of this marked distinction? It is evident that it is something which does not apply equally to all the days of the columns; yet, as it is the terminal number, it must relate to some one of them. If we examine the series carefully I think the reason for the distinction will be explained. Written out in full, it is as follows:

I.
Ahau
Eb
Kan } 10, XI; 10, VIII; 10, V; 10, II; 12[?], (I).
Cib
Lamat

The last black number is 10 in Brasseur's fac simile, but should be 12. Making this correction, the series is regular and of the usual form. The sum of the black numbers is 52, which is the interval between the days, and the number over the column is the same as the final red number.

If we turn now to the calendar (Table II) and select Ahau of the Kan column, and 1, the seventeenth number of the eighth figure column, and count 52 days, we reach 1 Eb, the second day of our column as given above; 52 days more bring us to 1 Kan, the first

day of the first month in the calendar and third day of our column. If the theory of the four year series be correct, then 1 Kan of the Kan series must be the first day of the first year of an Indication or week of years. This fact was probably considered by the aboriginal artist of sufficient importance to give this day a mark of distinction. As it is not possible for any of the other days of the column to be thus distinguished, it is fair to presume this peculiar marking of the final number refers to Kan. Moreover, this distinction would not occur if any other than the Kan series were used.

In the upper division of Plate IX of the same manuscript is the following series:

XIII
Men
Manik
Cauac
Chuen
Akbal
} 20, VII; 20 (I); 1, II; 4, VI; 7, XIII.

In this, I, the second red number of the series, has the circle of dots around it. The number over the column is partially obliterated, but is readily restored, and should be XIII.

If we select, on our calendar, the Cauac column, or series, a reason for this distinction will appear. The sum of the black numbers is 52, which is also the interval between the days. As has heretofore been shown, the red numbers of the series refer to certain days selected by the priests, for special reasons unknown to us, which occur between the days of the column.

In this case the intermediate days are as follows:

Between 13 Manik and 13 Cauac: 7 Manik, 1 Manik, 2 Lamat, and 6 Eb.

Between 13 Cauac and 13 Chuen: 7 Cauac, 1 Cauac, 2 Ahau, and 6 Kan.

Here we find the explanation for which we are seeking, as in the interval between 13 Cauac and 13 Chuen is 1 Cauac, which, if the Cauac column of the calendar be selected, is the first day of the year 1 Cauac, the first year of an Indication. As this occurs only when a year commencing with Cauac is selected, we infer that the series is based upon the system with the four year series.

The best illustration of this peculiarity and the strongest evidence of its signification is probably found in the series contained in the middle division, Plate XI, same manuscript. This, when written out and the numbers properly arranged, is as follows:

(I) (I)
Oc Ahau
Cib Cimi
Ik Eb
Lamat Ezanab
Ix Kan
} 1, II; 2, IV; 2, VI; 5, XI; 2, XIII; 4, IV; 9 (?) (I).

The last black number of the series is 9, but should be 10 to render the series complete. Making this correction, the series is of the usual type; the sum of the black numerals is 26, the interval between the

days of the columns is 26, and the final red numeral is the same as that over the columns.

As the circle of dots is around the final red number and also around each of those over the columns, the distinction indicated must refer to one or more days of each column.

As the last days only of the columns are year bearers, the mark of distinction probably applies to them. Selecting for the left hand column the Ix series of years and commencing with 1 Oc, the seventeenth day of the eighth month, we count 26 days. This brings us to 1 Cib, the third day of the tenth month, or tenth figure column of our calendar and second day of the first day column of the series; 26 days more to 1 Ik; 26 more to 1 Lamat, and 26 more to 1 Ix, the first day of the year 1 Ix, which, according to the four year series, will be the first year of an Indication. Selecting the Kan series for the second column and counting in the same way from 1 Ahau, the seventeenth day of the eighth month, or eighth figure column of the calendar, the last day is found to be 1 Kan, the first day of the year 1 Kan, which must also be the first year of an Indication.

Unit numerals marked in this manner are found in two or three places in the Cortesian Codex, but there is none in the Dresden Codex. The series with which they are connected in the former, except that in the middle division of Plate 24, are too much obliterated to be traced throughout. This, by making two slight and apparently authorized corrections, is as follows:

(1)	
Cimi Ezanab Oc Ik Ix	11, XII (?); 11, X; 6, III; 8, XI; 7 (?), V; 9, I.

The first red numeral of the line is X in the original and the next to the last black number is 6. By changing the former to XII and the latter to 7 the sum of the series will be 52, which is the interval between the days of the column.

Using the Ix column in the calendar and commencing with 1 Cimi, counting as heretofore, the last day of the column of the series is found to be 1 Ix, the first day of the year 1 Ix and the first year of an Indication, according to the four year system.

A somewhat remarkable confirmation of the theory here advanced is presented in a series found in the middle division of Plate II of the Manuscript Troano.

The series, when written out with the substitutes heretofore used, is as follows:

(1)	(1)	
Manik Men (?) Chuen Akbal Men	Ymix Been Chicchan Caban Muluc	9, X; 6, III; 11, I.

In Brasseur's fac simile the second symbol of the left hand column is clearly that for Men. If this be accepted as correct, then no year bearer (Kan, Muluc, Ix, Cauac) would be found in either column and the theory we have advanced regarding the signification of the dots around the red unit over the column would fall to the ground. Nor is this the only difficulty we meet with in attempting to apply the theory to this series. The sum of the black numbers is 26, which should also be the interval between the days of the columns. Counting 26 days from 1 Manik brings us to 1 Been instead of 1 Men; 26 more to 1 Cauac, a day not found in either column as given in the original. Taking the second column and counting 26 days from 1 Ymix, we reach 1 Manik, instead of 1 Been. This gives us the key to the series and solves the riddle. We must commence with 1 Ymix, then take 1 Manik, then 1 Been, and so on, going alternately from column to column.

Adopting this method and using the Cauac column of our calendar, Table II, the result is as follows: Commencing with 1 Ymix, the third day of the tenth figure column, and counting 26 days, we reach 1 Manik; 26 days more bring us to 1 Been, and 26 more to 1 Cauac, the first day of the first year of an Indication. The 1 Men of the left hand column should therefore be 1 Cauac, which is also proved by counting the intervals, without regard to the week numbers. For example, from Ymix to Been is 12 days, from Been to Chicchan 12 days, from Manik to Cauac 12 days, and so on through each column. Or, if we take the columns alternately, the interval is six days, thus: From Ymix to Manik, 6 days; from Manik to Been, 6 days; from Been to Cauac, 6 days; from Cauac to Chuen, 6 days, and so on to the end.

Although the proof is not absolutely conclusive that these red unit numerals have this mark of distinction for the reason given, it nevertheless furnishes what would seem to be a satisfactory explanation, and, if so, affords proof that the calendar system, based upon the four year series, was in vogue when the Manuscript Troano and the Codex Cortesianus were written.

This mark of distinction is found in a strange and unusual relation in the lower division of Plate XV, Manuscript Troano. The first red numeral of the series is given thus :

FIG. 372. Numeral character from the lower division of Plate XV, Manuscript Troano.

Most of the day and about half of the numeral symbols are obliterated, but all that are necessary for present purposes remain distinct and uninjured, as follows :

III, Ix Cimi) 10, XI[ ]I.

Judging by these and the few numbers remaining, the entire series was as follows :

III,
Ix
Cimi
Ezanab } 10, XIII : 4, IV : 20, XI : 9, VII : 9, III.
Oc
Ik

The only doubt in reference to the restoration is whether the second and third pairs of numerals should be as given, or 2, II, and 22, XI. If we select the Kan column of our Table II and count from 3 Ix of the eleventh figure column, we reach 13 Kan. If the four year series was the system used 13 Kan might be the first day of a year, but not the first day of an Indication. As this is the only day referred to by the XIII which could have been the first of a year we must seek an explanation in something else. Counting ten days from 3 Ezanab will bring us to 13 Lamat, which is the last day (counting the five added days) of an Indication, commencing with the year 1 Kan and ending with the year 13 Kan.

According to my theory of the ahaues,[1] the year 13 Kan would have corresponded with the Gregorian years 1376, 1428, 1480, and 1532. According to the theory advanced by Perez,[2] it would have corresponded with 1385, 1437, 1489, and 1541.

It is therefore possible that this mark of distinction may be of some value in determining the relation of the Maya to the Gregorian calendar.

[1] See Table XVII, Study of the Manuscript Troano, by Cyrus Thomas, p. 44.
[2] See Table XVIII, ibid., p. 45.

CHAPTER III

THE WRITING.

It must be admitted that none of the attempts made at deciphering the writing in these manuscripts has proved entirely satisfactory; in fact there is still some doubt as to whether any of the characters are truly phonetic; nevertheless it is believed that what is here shown will tend to lessen this doubt. It must be conceded, however, notwithstanding these drawbacks and difficulties, that some material progress has been made towards a better understanding of its type and of the nature of the characters.

The direction in which it is to be read must of course be determined before any progress can be made in deciphering it. This was, until recently, a matter of speculation, but now may be considered settled. As this has been explained[1] it is unnecessary to repeat that explanation here.

A certain parallelism in the sentences or groups of characters has also been discovered. Attention was first called to this by me in the work referred to, but is more fully explained by Dr. P. Schellhas in his paper entitled "Die Mayahandschrift der königlichen Bibliothek zu Dresden." It will readily be understood from a single illustration. Take for example the lower division of Plate XV of the Manuscript Troano (see Study Ms. Troano). Omitting from consideration the numerals and the day column at the left, there are here two short columns on the left and two on the right over the animal figures, and three longer columns between. As explained in the work referred to, the short columns are to be read as lines from left to right and the longer columns separately, from the top downward. There are, in all, five groups or sentences, each containing four compound characters. Representing these by letters, repeating those which indicate similar characters, and arranging as in the plate, the result is as follows:

b	*a*	*h*	*l*	*m*	*w*	*a*
r	*n*	*a*	*a*	*a*	*r*	*s*
		r	*r*	*r*		
		p	*k*	*t*		

In this case the characters represented by *a* and *r* are repeated in each group and in the same relation to the other characters. It is

[1] See Chapter VI, Study of the Manuscript Troano, by Cyrus Thomas.

apparent, therefore, that each group is to be read separately, and, as each repeats in part what is given in the others, it is more than probable that they are simply short formulas to be repeated in certain religious ceremonies. This parallelism, though not always so apparent as in the case presented, is nevertheless found running through all the codices. The advantage to the attempts at decipherment which results from this fact is evident, as it will often justify the restoration of blurred or obliterated characters, and, what is of still more importance, will enable the investigator to test his conclusions by comparing the different characters and pictures with which they are associated.

Although it appears to be well settled that, as a rule, the writing, when in lines, is to be read from left to right — the lines following each other downward and the columns to be read from the top downward, but the groups, as before explained, to be read separately—it does not follow that the *groups* succeed one another from left to right. This has generally been taken for granted, but there are some reasons to doubt the correctness of this conclusion as regards a number of plates and possibly one entire codex.

The facts that the lines of numerals attached to the day columns extend to the right and that the written characters, when in lines, follow one another in the same direction lead us to infer that the groups and pictures follow one another in the same order, but the apparent movement of the latter towards the left would seem to indicate that *they* follow one another in *this* direction. This inference appears to be confirmed by the following evidence: As is well known, the plates of the Manuscript Troano are to be taken in reverse order to the paging. Turning to Plate II, we observe in the middle department of the middle division a bound captive or victim, on whose neck a machete is descending to sever the head from the trunk. Turning to Plate III, which properly stands to the left of Plate II, we see a headless trunk covered with blood and the fatal machete near the neck. It is fair to presume that this is the same individual that is figured in the preceding plate, and, if so, that the pictures follow one another toward the left.

Placing Plates XV* and XVI* of the same manuscript in the proper relation to each other and carefully examining the figures in the second division, we notice that the idol heads which the artisans are carving approach completion as we move toward the left, those in Plate XV* and the right hand one in XVI* being simply blocked out, while the middle one in the latter plate is completely rounded and is receiving the second ornamental line and the one at the left hand is receiving the third and final line.

The female figures in the second division of Plate XIX* indicate the same order, as shown by the increasing girth as we proceed toward the left.

The same order appears to be indicated in numerous places by the symbols of the cardinal points inserted in the text, as they (supposing the conclusion as to their assignment in my "Notes on certain Maya and Mexican manuscripts," accepted by Drs. Förstemann and Schellhas, to be correct) follow one another in the proper order if read towards the left, to wit, south, east, north, west.

As the writing over each figure, consisting usually of four compound characters, appears to refer to that over which it is placed, it follows that these character groups must be taken in the same order as the pictures. The suggestions on this point are presented here more as proper subjects of investigation by students of American paleography than as fixed conclusions of the writer. If found to be justified by the facts, they will furnish some additional aid in the work of deciphering these manuscripts.

SIGNIFICATION OF THE CHARACTERS.

As Landa's alphabet has so far proved useless as an aid in deciphering these manuscripts, our only hope of accomplishing this end is by long and careful study of these records and laborious comparisons of characters and the relations in which they stand to one another and to the figures.

Some discoveries made while preparing this paper for the press, which are mentioned further on, may possibly give us the key to the method used by Landa in forming his alphabet, and, if so, will probably furnish some slight additional aid in our investigations.

The direction in which the writing is to be read having been ascertained, our next step is to determine by comparison the probable signification of as many characters as possible before discussing the question of phoneticism. The relation of the characters to the pictorial representations forms our chief reliance in this branch of the investigation.

As a commencement in this work and as a basis for further attempts in the same direction, attention is now called to some characters, other than the day and month symbols, whose signification seems to be satisfactorily determined. As there is still some difference of opinion as to the assignment of the symbols of the cardinal points they are also omitted from the list. M. Léon de Rosny has given, as a supplement to his edition of the Cortesian Codex, a list of characters with their supposed signification. It is not my intention to discuss here the merits of this vocabulary, although I shall avail myself of so much found therein as appears to warrant acceptance.

The question of phoneticism will not be considered in connection with the list, as the subject will be briefly discussed at the close, the only object in view in giving the list being to indicate the significa-

tion of the characters alluded to. The Maya names appended are therefore to be understood simply as the supposed names applied to them or the objects they denote.

SYMBOLS OF ANIMALS &C.

No. 1.

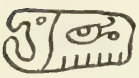
Kal. The symbol for the number 20. Found in all of the codices and explained in the preceding portion of this paper.

No. 2.

The symbol for 0 (nought), always red. Found only in the Dresden Codex and always in the numeral series.

No. 3.

Kin. Sun, and probably day also. It is not known positively that it has this signification except in connection with the equatorial cardinal point symbols and the symbol of the month *Yaxkin;* yet it is reasonable to suppose it has.



a

b

c

d

No. 4.

Aac or *Ac.* A turtle. That this symbol as shown in *a* and *b* denotes the turtle is conclusively proved by its resemblance to the head of that animal, as figured in the Cortesian Codex (see Fig. 373) and its relation to these figures. Found only in this codex, unless two doubtful symbols on Plate XXV*, Manuscript Troano, are to be considered as variants.

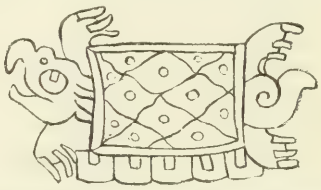


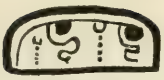
Fig. 373. Turtle from the Cortesian Codex.

There can be no doubt that Landa's *A*, an exact copy of which is given in the margin, in both varieties, *c* and *d*, is nothing more nor less than this symbol; for, in addition to the very close general resemblance, we see in it the eye and the dot indicating the nostril. This fact is important, as it gives us some clew to the method adopted by Landa in forming his alphabet.

No. 5.

Uech. Symbol or head of the armadillo of Yucatan. Appears but once or twice and in the Manuscript Troano only. (See Study of the Manuscript Troano, by Cyrus Thomas, pp. 98 and 145).

Che. Wood. (See Study of the Manuscript Troano, by Cyrus Thomas, p. 144).

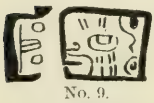


No. 7.

Cab. Earth, soil; also honey. (See Study of the Manuscript Troano, by Cyrus Thomas, p. 150.)

No. 8.

Piz. Stone or stone heap. (See Study of the Manuscript Troano, by Cyrus Thomas, p. 144). The Maya name of the thing indicated is uncertain, though I am inclined to believe *Piz*, as given in the work alluded to, is correct.



No. 9.

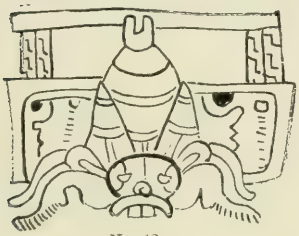
U. The left symbol of this figure appears to stand for vase, and is also used to indicate a pronoun or article when joined to another symbol, as here shown. (See op. cit., p. 145.)

No. 10.

Xicim. The ear. Rosny, Vocābulaire hiératique, No. 185.

No. 11.

Hau. The quarter of a deer. Usually represented as an offering to the gods; in all the manuscripts.

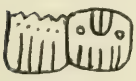


No. 12.

Ikilcab. The bee. Although the figure bears a much stronger resemblance to a beetle than to a bee, there can be no longer any doubt that Brasseur's supposition that it represents a bee is correct.

No. 13.

Honey in the comb. (See Study of the Manuscript Troano, by Cyrus Thomas, Fig. 20); in the Manuscript Troano only, and always in red.



No. 14.

Xamach or *Chimix.* A vessel. This symbol, found in all the codices, is apparently explained by its use in the upper division of Plate 27, Cortesian Codex, where it stands over each of four vessels or jars of the form represented in Fig. 374.

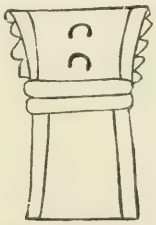


Fig. 374. Jar from the Cortesian Codex.

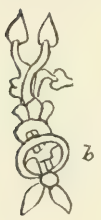
This conclusion is greatly strengthened by the fact that the only other symbols in this connection are those of the cardinal points, one to each vessel. These figures are probably intended to denote here the four sacred vessels or amphoræ of the Bacab, though not surmounted, as Brasseur supposed, by human or animal figures.

The symbol appears to be used also in the ordinary sense, or at least to signify other vessels than the sacred four, if we may judge by its frequent repetition in Plate XIV, Manuscript Troano. But it is worthy of notice that here also, in both the middle and lower divisions, four of the symbols are connected with the cardinal point symbols; there is also in the former the figure of a vessel.

If this identification be correct it is important, as it has a strong bearing on the question of phoneticism. It will be observed that, although the right hand member resembles closely the symbol of the day Ymix, there are some differences, as may be seen by comparison. In the former the little figure at the top is divided as in Kan, and on each side of it there is a large dot, usually, and apparently by intention, circular or hollow. These differences are permanent in the different codices.

In the upper division of Plates X and XI, Manuscript Troano, where this symbol appears in connection with each of the four cardinal symbols, that relating to the east presents this remarkable variation:

(?) A conventional figure of sprouting maize, never inserted in the text, but frequently in the Manuscript Troano and in the Peresian Codex made a part of the head gear of figures of deities, in which case the Kan symbol is generally omitted.



The Kan symbol in this connection cannot be intended, as Dr. Schellhas supposes, to indicate the field or milpa in which the corn is growing, but the grain from which the plant is springing. (On this subject see Study of the Manuscript Troano, by Cyrus Thomas, pp. 105 and 107.)

No. 15.

(?) Symbol of a worm which gnawed the roots of the growing agave or maguey; appears but once, on Plate XXIXc of the Manuscript Troano.

No. 16.

The animal head and teeth show the erroneous idea the natives had of the gnawing apparatus of insects. The worm is shown on the next page in Fig. 375.

FIG. 375. Worm and plant from Manuscript Troano.

FIG. 376. Figure of a woman from the Dresden Codex.

No. 17.

Chuplal. Woman or female. This symbol is found in the Dresden and Troano Codices, but most frequently in the former. The appendage at the right is sometimes wanting, and occasionally that at the left, but when this is the case some other prefix is generally substituted.

If we examine carefully Plates 16–20 of the Dresden Codex, where this symbol is most frequently repeated, and compare it with the heads of the females there figured, it soon becomes apparent that the scrolls with the heavy black dot are intended to denote the locks of hair and that the symbol as a whole is, as usual, a modified or conventional form of the head (see Fig. 376).

a

b

Otoch. A house or dwelling, or *Tabay;* a hut or hunting lodge. The symbol marked *a* is found in the Cortesian Codex on Plate 29; that marked *b*, on Plates 29, 32, and 34, same codex, and on Plates XVI* and XXII* of the Manuscript Troano. The one marked *c* is the usual form in the latter, as on Plates V*, VII*, and X*. It is also on Plate 28 of the Dresden Codex.

c

No. 18.

The relation of these symbols to the conventional figures of houses or huts inserted at the points where they are found, together with the form, which shows an attempt to represent the thatched or leaf covered roof, leaves no doubt that they are used for the purpose indicated.

a

Buk (?). There are good and, it is believed, satisfactory reasons for concluding that these symbols are intended to denote the action of whirling a stick to produce fire or rolling a pestle in grinding paint. The first, marked *a*, is found only on Plate XIX of the Manuscript Troano, and the second, on Plates 5 and 6 of the Dresden Codex.

b

No. 19.

A copy of part of Plate XIX of the Manuscript Troano is introduced here (see Fig. 377) to show the relation of the figures to the characters. If this interpretation be correct, we see here an evident attempt on the part of the aboriginal artist to indicate by the symbol the action nec-

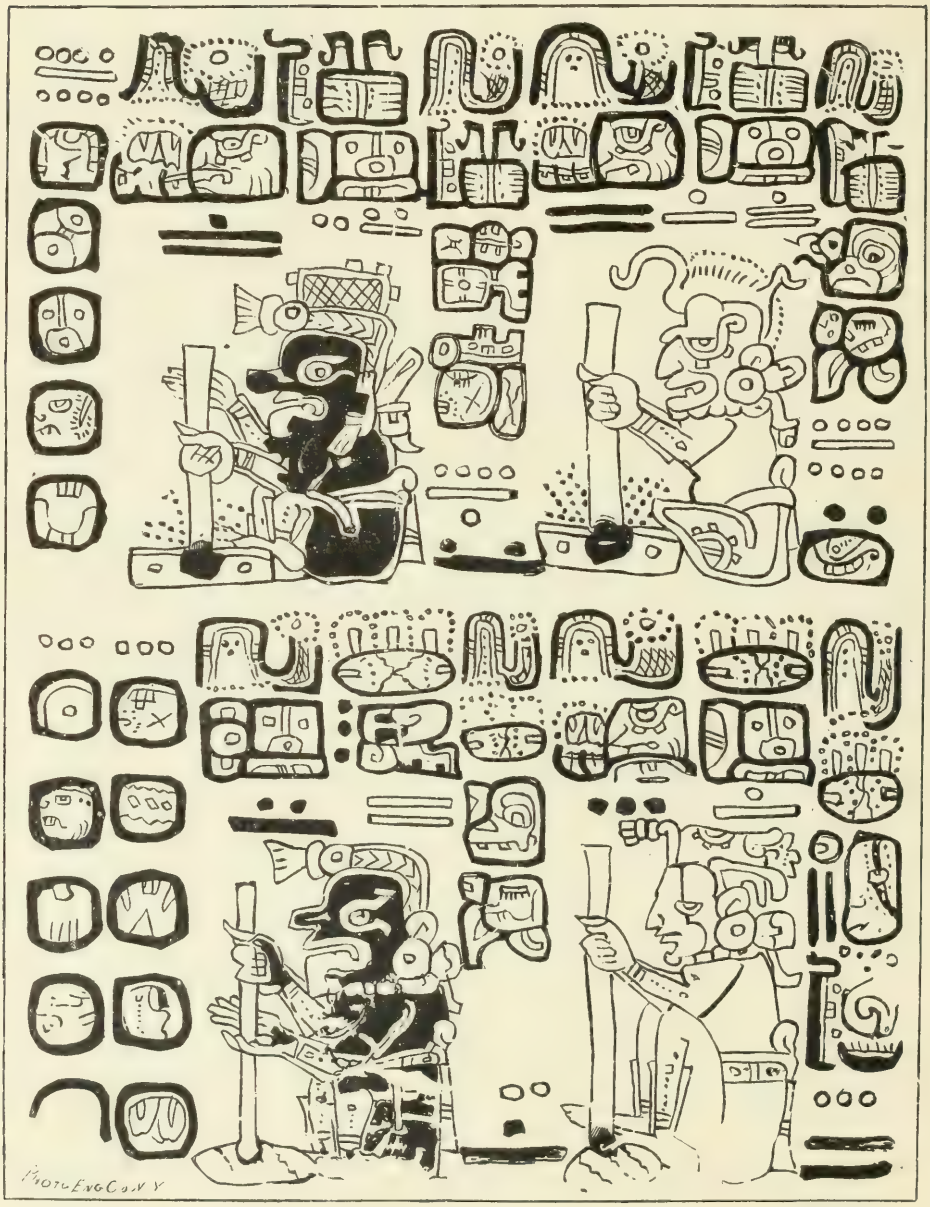


Fig. 377.

essary in the work to be performed. It is probably a conventional sign, and not a phonetic character.

No. 20.

(?) In all probability one of the symbols used to denote the act of walking or taking steps. Found but seldom in this particular form, though each portion occurs frequently alone or in other combinations.

A remarkable series of figures and written characters runs through the lower division of Plates 65 to 69 of the Dresden Codex, apparently devoted entirely to the representation of incidents in the life of the culture hero Kukulcan, or deity mentioned on a subsequent page as the "long nosed god" or "god with the snake-like tongue," or to ceremonies to be performed in honor of this deity. Over the figure are three lines of written characters, as shown in Fig. 378, which

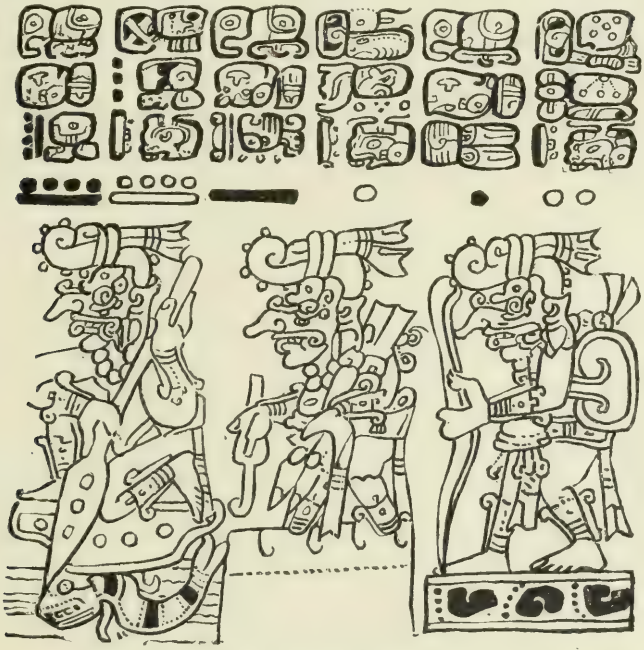


FIG. 378. Copy of lower division of Plate 65, Dresden Codex.

is a copy of the lower division of Plate 65. These, as is readily seen, are in groups, one group of six compound characters over each figure of the god. There are thirteen figures of the god and thirteen of these groups of characters in the series. The characters of a group, as may be seen by reference to the figure, are arranged in the following manner:

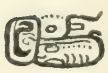
a	*b*
c	*d*
e	*f*

to be read (presumably) in the alphabetic order of the letters given; though the order in which they are to be read is not essential at present. Examining the series carefully we find that the first character of each group corresponding with *a* in the above diagram is the same throughout. The same thing is true in reference to the third, or that occupying the place of *c* in the diagram, which is the symbol of the deity. The sixth, or that corresponding with *f* in the diagram, is also the same throughout the series; the fifth, corresponding with *e*, is substantially the same throughout, though subject to more variations than any of the other characters. It follows, therefore, that the chief and almost the only differences in the readings of the groups are to be found in the second and fourth characters, or those represented by *b* and *d* in the above diagram; the others (at least those represented by *a*, *c*, and *f*), if referring at all to the figures, must relate to something found in or applicable to each. The third (*c*), as stated, is the symbol of the deity and corresponds in the text with the figure of the god in the pictures. As this deity figure is the only thing found in all of the representations, we must seek for the explanation of the other two permanent characters in something else than what is figured.

Comparing the second character (*b*) of each group with that upon which the god is seated or standing, we find sufficient evidence to satisfy us that this symbol is the one which is used throughout to indicate this object. For example, the second symbol in the group on Plate 69 is an exact copy of the object on which the deity is seated. The same thing is substantially true of that in the left hand group of Plate 66, the middle group of 67, and the right hand group of 68.

Assuming, on account of the remarkable regularity of this series and the fact that the deity is in each case seated or standing on something, that this rule holds good throughout, we have a clew to those corresponding symbols which are not simple copies of the things they are used to indicate.

Turning to Fig. 378, we observe in the right hand department the marks of footsteps under the deity and the character shown in the margin (No. 20) as the second of the group above the deity. It is worthy of notice that in the two we find precisely Landa's two characters for the letter B. Is it possible that the two principal parts of this compound character denote the Maya words *oc be*, "foot journey" or "enters upon the journey"? Attention will be called to this further on, but it is proper to state here that as the prefix is found in three other corresponding characters it cannot be a necessary part of that which represents the footsteps in this case.

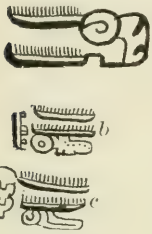


No. 21.

Assuming the theory above given as to the characters in the inscription which represent the things under the deity figures to be correct, the second character in the middle group of the lower division of Plate 65, shown in Fig. 378, will be the symbol for the substance represented by scrolls under the figure of the deity.[1]

[1] Unfortunately the scrolls were overlooked in preparing the cut.

The prefix in this case is the same as that to the symbol above described (No. 20), and of course has the same signification. The other portion of No. 21 must therefore represent the substance in which the god is walking. This appears to be dust, sand, or mud.



No. 22.

Cacanak or *cacauche*. The wild or cultivated cacao. Found a number of times in the Dresden Codex, sometimes as represented in the marginal figure *a* and sometimes as in *c*, and always in connection with figures holding in the hand a fruit of some kind. It appears once in the Cortesian Codex (Plate 36), as shown in *b*, in connection with a fruit of precisely the same kind as that figured in the Dresden Codex. It is found also on Plate XVIII* of the Manuscript Troano, but is apparently used here to denote an action.

There can be little, if any, doubt, judging by the figures in connection with which it is found, that this symbol is used in the Dresden and the Cortesian Codices to denote the cacao. Whether it refers to the tree or to the fruit is uncertain; possibly the different forms in which it is found are intended to denote these distinctions. In some of the figures the capsule appears to be indicated; in others the seed. The prefix to figure *c* apparently indicates the heaping or piling up of the fruit on the dish held in the hands of the individuals figured in the same connection, as, for example, on Plates 12 and 13 of the Dresden Codex. If this supposition be correct it gives us a key to the signification of this prefix. Reference to its use in the upper division of Plate XVIII*, Manuscript Troano, will be made further on.

In this symbol we find another of Landa's letters, and, if phonetic, agreeing precisely with his interpretation.

Ekbalam according to Rosny. The variety marked *a* is found twice in the Manuscript Troano, Plates XVI and XVII, and that marked *b* once in the Dresden Codex, Plate 8, each time in connection with a spotted, leopard-like animal.

No. 23.

The black markings on the symbols render it probable that Rosny's interpretation is correct. The numeral before the first form may possibly be explained by the fact that this symbol is used once (Manuscript Troano, Plate XII) to indicate the day Ix.

No. 24.

Moo. The ara, a large species of parrot. This symbol is found but once, and that in Plate 16*c*, Dresden Codex, in connection with the bird shown in Fig. 379.

Fig. 379. The moo or ara from Plate 16, Dresden Codex.

The conclusion in this case is based on the following evidence: In this series there are six groups of characters, four compound characters in each group, arranged as in the annexed diagram:

a	*b*	*e*	*d*	*g*	*h*	*i*	*m*	*o*
c	*d*	*c*	*f*	*c*	*d*	*c*	*n*	*b*
1		2		3		*k*	*c*	*c*
						l	*l*	*p*

Similar characters in the different groups are represented by the same letter; for example, the symbol for woman, heretofore shown (No. 17), is represented by *c*, and an unknown character by *d*. Different letters represent different symbols. It is apparent that we have here the parallelism heretofore spoken of and are justified in basing conclusions on this fact.

At 1, 2, and 3 are female figures with a bird in each case perched on the back. At *a* is the head of a bird, evidently the symbol of the bird on the female below; at *i*, in the fourth group, is precisely the same symbol as the one found in the same relative position in the middle division of Plate 17 over another bird, and at *m*, in the fifth group, is another bird's head. From these facts we conclude that the first symbol in each of these groups denotes a bird, and, as no two are alike, that they refer to different species, the one at *g* corresponding with symbol No. 24, the bird beneath being the great parrot or ara. Other facts, derived from a careful study of the various groups of this portion of the codex, which would require much space and numerous illustrations to explain, lead to the same belief.

According to this conclusion, the following symbols also denote birds, probably of the species here indicated.

No. 25.

Icim? The horned owl. This is represented by *a* in the first group in the above diagram.

The bird in the figure under the group, although horned, bears but slight resemblance to an owl; yet, comparing the marks on the tail with those of two of the birds on Plate XVIII* of the Manuscript Troano, I think the interpretation is justified.

No. 26.

Kukuitz? The Quetzal. The symbol is apparently incomplete, but the bird figured under it justifies this conclusion. This symbol is represented by *e* in the above diagram.

If this interpretation be correct, we find in this symbol another of Landa's letters.

a

b

No. 27.

Kuch. A vulture or bird of prey much like the sopilote. These two symbols (*a* and *b*) appear to refer to the same bird, evidently a vulture. (See Manuscript Troano, Plates XVII *a* and XXVI* *a*.) The first form (*a*) is found but once (Manuscript Troano, Plate XVII *a*), the other at several points, both in the Manuscript Troano and the Dresden Codex, and is represented by *m* in the preceding diagram.

If this determination be correct, the first of these symbols (*a*) is probably phonetic and agrees with the interpretation of No. 26.

No. 28.

Cħom, *Xchom*, or *Hcħom*. The sopilote or vulture. Found only in Plates 16 and 17, Dresden Codex. The bird figure in Plate 17 appears to be intended to represent a vulture. The symbol corresponds to *i* in the preceding diagram.

If phonetic, the word indicated should, according to Landa's alphabet, be aspirated, which is found to be true of one of the forms given by Perez.

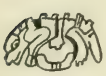
In certain series of the Dresden Codex, which appear to relate to the four year series or to the four seasons, especially those on Plates 29–31, a certain class of food animals seems to be assigned to each. The four following symbols are those used to express this idea:

No. 29.

Ceh? The symbol for game quadrupeds. The same idea appears to be indicated by the folded and tied quarter of a deer, as shown in No. 11. The head shown in the symbol is probably intended for that of the deer, though more like that of the rabbit.

No. 30.

Cutz or *Cax*. The symbol for game birds, the head being probably that of the wild turkey (*Cutz* or *Ahcutz*).



No. 31.

Huh. The symbol for food reptiles or the iguana.

As the Kan figure is admitted to be a maize or bread symbol, it is readily seen that the object in view in connecting it with the animal figures is to indicate that they are used for food, and hence are proper offerings to the gods, which is equivalent to saying, to the priests.

No. 32.

Cay. The symbol for food fishes, or fishes in general, though as often on the Kan symbol or without any suffix.

No. 33.

Cutz or *Cax*. In one of the two series of these food symbols, in Plates 29–31 of the Dresden Codex, in place of the bird symbol No. 30 is that shown in symbol No. 33. It probably has, as Rosny supposes, the same signification, a supposition which is strengthened by the fact that it is found in the bird series on Plates 16*c* and 17*c*, same codex, and is represented by *o* in the preceding diagram.

SYMBOLS OF DEITIES.

No. 34

Ekchuah. The symbol or hieroglyph of the deity named "Ekchuah" by the Mayas and considered the patron and protector of peddlers or traveling merchants (Fig. 380).

FIG. 380. The god Ekchuah, after the Troano and Cortesian Codices.

The signification of the name of this deity is "The Black Calabash." The form and the shading of the symbol render it more than probable that it is a conventional representation of a divided or halved black calabash or gourd, cut for the purpose of forming it into a cup or dipper, which, in this form, is considered a symbol of this deity.

The evidence upon which this determination is based is that the symbol constantly accompanies the red mouthed, black deity. It is found, with a single exception, only in the Manuscript Troano, and chiefly in Plates II to V, relating to the traveling merchants. The single exception alluded to is on Plate 15 of the Cortesian Codex; here the god bears upon his back the traveling pack, indicating the vocation of which he is the special guardian.

It occurs unconnected with the figure of the deity only on Plates IX*, XIV*, XV*, and XXV* of the Manuscript Troano. In the last the figure of the god is in the same division, but in the adjoining compartment.[a] In Plate XV* it apparently refers to the idol the priest is carving, which is probably a black one intended to represent this god. Landa,[1] speaking of the artists carving idols from wood, says:

> They took also that which they used for scarifying their ears and drawing blood from them, and also the instruments which they needed for sculpturing their *black divinities.*

Its appearance in Plate XIV* is apparently in connection with the

[1] Relacion de las cosas de Yucatan, p. 308.

ceremonies relating to the manufacture of idols. Neither the symbol nor the god it represents is to be found in the Dresden Codex.

No. 35.

Kukulcan. (?) This is the symbol of the long nosed god, which Dr. Schellhas designates "the god with the snake-like tongue," of which representations appear so frequently in the different codices (see Fig. 381).

The snake-like appendages hanging from the side of the mouth may possibly be intended to represent a curved fang rather than part of a divided tongue. A remarkable figure on Plate 72 of the Borgian Codex deserves special notice here. This is the representation of a deity supposed by Kingsborough and others to be Quetzalcoatl, in which the head is as represented

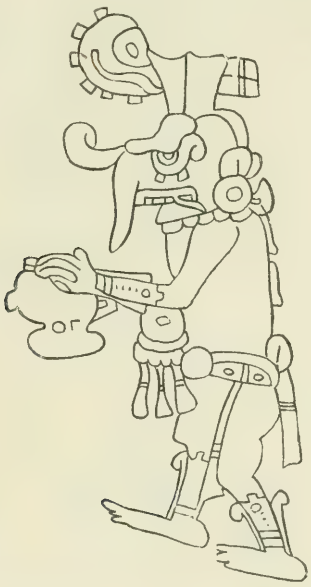


Fig. 381. The long nosed god (Kukulcan) or "god with the snake-like tongue."

in Fig. 382. Here we see both tongue and fang, and also an eye precisely of the form found in the Maya symbol.

Whether Kukulcan is the god indicated is uncertain, unless he is identical with the long nosed god, or Maya Tlaloc, so frequently figured in the Manuscript Troano and the Cortesian Manuscript. It is only necessary to compare the figures on Plates 2 to 5 of the latter codex with the long nosed, green figures of Plates XXVI, XXVII, XXIX, XXX, and XXXI of the former to be convinced that they represent the same deity, and that this is the Maya Tlaloc or rain god, whatever may be the name by which he was known.

As the symbol which accompanies these is the same as that found in

connection with the "snake tongued," long nosed god of the Dresden Codex, there is no doubt that the same deity is referred to. It is worthy of notice in this connection that Plates 29–41 of the Dresden Codex, which are devoted almost exclusively to this deity, refer very largely to water, the god being figured in connection with water no less than twenty-eight times. He is also twice colored black, probably to symbolize the dark rain cloud, and twice blue, denoting water. It is therefore fair to conclude that the author of this codex considered him the giver of rain.

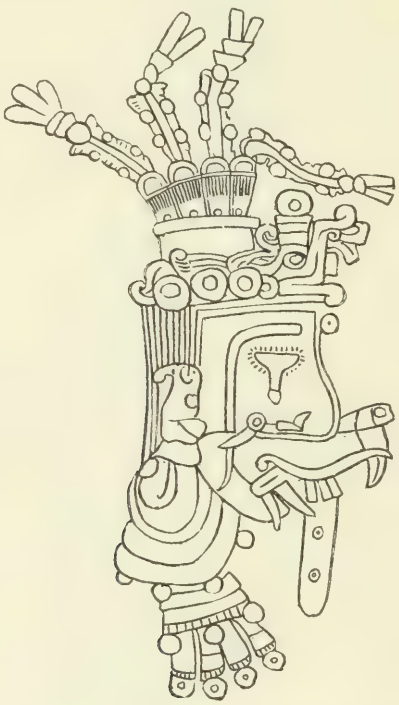
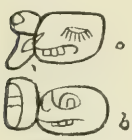


FIG. 382. Copy of head from the Borgian Codex (Quetzalcoatl).

The following reasons given by Dr. Schellhas for supposing that the deity indicated is Kukulcan apparently justify his conclusion, though it is possible some other name may have been applied to him:

He is represented in all the manuscripts, and far more frequently than any other deity. His characteristic marks are always unmistakable. An entire section of the Dresden Codex, pp. 29–43, and pp. 1 and 2, belonging thereto, treat almost exclusively of this god, and wherever he is pictured there we also find his name hieroglyph. He is always characterized by the double, snake-like tongue hanging from his mouth and by the peculiar eye, two marks that are never absent, how numerous and varied soever may be his representations, his symbols, and attributes. We also find him with torches in his hands as symbols of fire; he sits on water; he stands or sits in water or in falling rain; he rides in a boat; he appears in company with a fish as symbol of water or in company of a bird's head as symbol of the atmosphere, upon the day sign *Cab* as symbol of the earth, sitting, with the ax

(machete) in his hand, with arrows or spears, with a scepter, and finally, also, with the body of a snake. Considering the immense variety of this god's representations and the numerous symbols of power in the various elements which the deity rules, we may well be justified in assuming that there are indications here of one of the most important figures in Maya mythology, with one of the principal deities of the people. The most important god of the Mayas was Kukulcan, the creator of the country's civilization, who had come from the far, unknown east, the Mexican Quetzalcohuatl, the Gucumatz of the Kiche, the Kukulcan of the Tzendals. All these names mean "feathered snake," "bird snake." Now, in the above mentioned section of the Dresden manuscript, pp. 29–43, there is found on page 36, middle, the representation of a bird and a snake, the two symbols of the god Kukulcan, which, at the same time, denote his name in the manner of a rebus. That this representation is to be referred to the god with the snake's tongue is rendered probable on the one hand by the fact that this whole section treats of him and is proved on the other hand by the circumstance that in the same place the same snake is found represented with the head of the god; thus, page 35, middle, and 36, above. In the same way this snake with the god's head is also found in the Codex Cortesianus, page 10, middle, a passage which is rendered notable also by the fact that in the writing above the picture there is expressly found as a second sign the name hieroglyph of the god.



No. 36.

Cimi (?). Supposed symbols of the god of death. Occurring very frequently in all the codices, but with several variations (see Figs. 383 and 384).

These are given chiefly on the authority of Drs. Förstemann and Schellhas, as I have some doubt in reference to this conclusion, for reasons which will here be given.

FIG. 383. The supposed god of death, from the Dresden Codex.

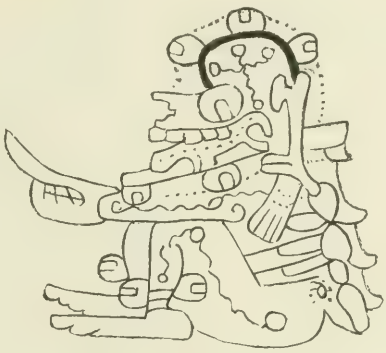


FIG. 384. The supposed god of death, from the Troano Codex.

As Dr. Schellhas remarks, this is "the most characteristic and most easily recognized deity of the Maya Codices"; but this statement will not apply to the symbols, as the variations are such as to render it exceedingly doubtful whether precisely the same idea is embodied in each. Even the two forms here given, both of which are found in all the codices and often together, present variations too marked for us to believe, except upon strong evidence, that they represent the same thing. Nor do the figures of this deity or supposed deity appear to embody throughout the same idea. In fact, they

leave us in doubt as to whether any one recognized deity is to be understood. Was there in the Maya pantheon such a deity as the god of death? I have so far been unable to find any satisfactory reason for answering this question in the affirmative.

In the first part of the Dresden Codex, which is devoted, in part at least, if not chiefly, to the maladies of the country, the skeleton figures undoubtedly have reference to death, much like the skull and cross bones in our day. In other places, as Plates XXVII and XXII* of the Manuscript Troano and Plate 7 of the Cortesian Codex, the parched earth appears to be intended, but it must be conceded that here also the idea of death is included. Substantially the same idea, or at least the relation of this god to the earth, appears to be indicated in Plate 8 of the Cortesian Codex, where he is represented as beneath and holding up that upon which another deity, bearing the bread symbol, is seated.

As before stated the two symbols frequently appear in connection, sometimes where the god is figured and often where he is not. It is, therefore, unsafe to conclude as yet that either variety indicates a particular deity known as the god of death.

No. 37.

Symbol of the god with the banded face; seen chiefly in the Manuscript Troano; not found in the Dresden Codex (Fig. 385). This is not the deity which Dr. Schellhas designates as "the god with face crossed by lines."

This deity evidently pertains to the underworld and is closely allied to the so-called god of death. The symbol and the figure are found

Fig. 385. The god with the banded face, from the Codex Troano.

together in but few instances, yet the peculiar markings are such as to leave no doubt on the mind that the symbol is intended to denote what is represented by the figure, being simply the head of the deity as invariably figured. They appear together in Plates III*c*, V*a*, and V*b*, XXVIII**c*, and XXIX*c* of the Manuscript Troano, in the first two as having some relation to the traveling merchants, but in the last two in a very different rôle. The dotted lines with which the bodies of these figures are marked and the peculiar anklets appear to

have been introduced to signify relationship to the god of death. Perhaps the most direct evidence of this relation is found in Plate 42 of the Cortesian Codex, where the two deities are brought together at the sacrifice here indicated. The two appear to be united in one in the lower division of Plate XXVI* of the Manuscript Troano.

Figures of this god are also found in some of the Mexican codices, as on Plate 73 of the Borgian manuscript, where the relation to death and to the underworld is too apparent to be mistaken. On Plate 10, same codex, the head of death is marked with the distinguishing black band.

Unfortunately for investigations in this line, the early Spanish notices of the Maya mythology are so brief and confused that we can derive but little aid from them in our efforts to identify the deities figured in these manuscripts. Possibly the one with the banded face may represent Cumahau or Hunhau, the prince of the lower regions; but the rôle he appears to play where figured, with the exception of Plate II, Manuscript Troano, and Plate 73 of the Borgian Codex, would scarcely justify the name.

No. 38.

(?) Symbol of the deity which Dr. Schellhas designates "the god with the old man's face." Found in all the codices and almost invariably in connection with the representation of the deity shown in our Fig. 386.

FIG. 386. The god with the old man's face.

The deity denoted by this symbol and by the figure which it accompanies is possibly Zamna or Ytzamna, a deified Maya hero, but the various rôles in which he is found make it difficult to decide on this point. He appears comparatively few times in the Dresden Codex, and only in the first few pages. In none of these is there anything to indicate his functions. In Plates 12*c* and 15*c* he holds a sun symbol in his hand, which might be supposed to refer to his attributes as "Kinich-Kakmo" but for the fact that the same thing is true of one or two other deities figured in the same codex. In the Manuscript Troano, where he is oftenest represented, his figure and his symbol appear most frequently in connection with the bee or honey industry; for example, on Plate V*c*, the only place in the first part of the manuscript where honey appears to be referred to, and

twenty-two times in that section of the second part, Plates I* to X*, relating to bees. He also appears to take an active part in the manufacture of idols, engages in painting, aids in the culture or gathering of cacao, engages in predatory excursions, and acts in various other relations. In the left compartment of Plate XXIV*a he bears on his head the head of a bird. In the remarkable double plate (41–42) of the Cortesian Codex he is twice figured, in the central area and at the east (top), and in each case is accompanied by a female deity. In the latter case both god and goddess are bearing in their hands the Kan or corn symbol. In Maya mythology Zamua was given a spouse named Ix Kan-Leox, which signifies the yellow frond or silk of maize.

Fig. 39.

Symbol, according to Dr. Schellhas, of the deity which he names "the god with face crossed by lines," found in all the codices, but most frequently in the Manuscript Troano and the Cortesian manuscript. The deity is usually represented as in Fig. 387.

Fig. 387. The god with face crossed by lines.

This is introduced here on the authority of Dr. Schellhas, although I have considerable doubt as to the correctness of his conclusion. He remarks in regard to it as follows:

Another characteristic and easily recognized deity, which, it is true, is comparatively rare in the Dresden manuscript, but occurs with extraordinary frequency in other codices, and whose sign it is not hard to find, is the god whose face is crossed [surrounded] by peculiar parallel lines, representations of whom are given in the Cortesian Codex (p. 11, below) and Dresden Codex (p. 13, middle). The deity is always male and is found in the Dresden Codex five times, Cortesian Codex eighteen times, Manuscript Troano twenty times, and Codex Peresianus five times.

The sign of this god, as was the case with the others and as seems to be the general rule, consists merely of a representation of the god's head, combined with a sign which probably represents an affix. The sign is found wherever the deity is represented and is an exact rendering of the god's head, so that there can be no doubt as to its being the name hieroglyph. True variations are not found, the hieroglyph being perfectly alike in all the manuscripts.

The nature of this deity is not easily determined, though it occurs in the Codices Troano and Cortesianus with extraordinary frequency, so that it would be seen that these two manuscripts, which evidently belong together, treat principally of this deity. No analogous deity is found in Aztec picture writing. * * * To all appearances we have here a momentous figure of Maya mythology, of which, unfortunately, we know nothing.

It is true that this symbol is found in almost every instance where the figure of the god appears—in fact, with fewer exceptions than

others in reference to which there is probably little doubt. It is also true that the symbol is an exact copy of the god's head; but on the other hand there are strong reasons for doubting the correctness of Dr. Schellhas's conclusion.

The first is that the figure of the supposed deity seems to have more indications of being the conventional representation of an idol than of a deity. The lines of the head are precisely the same as those on the heads of the carved idols.[1]

We also find it in connection with the wood symbol (marginal No. 6) at the only points where the latter is found in the Cortesian Codex, and, what is significant, in wholly inappropriate places unless connected with an idol figure. These are found in the lower division of Plates 10 and 11, two on the top of thatched roofs and another on the head of the deity called the "god with the old man's face," the head in the latter case being apparently carved from a block of wood.

The second is to the same effect, the symbol being found over each of the figures of the lower division of Plates 26, 27, and 28 of the Cortesian Codex and the middle division of Plates XXXI* and XXXII* of the Manuscript Troano, where there appear to be processions of the different deities. It is also significant that in the latter case each deity is bearing in his hands what seems to be a block of wood from which in all probability an idol is to be carved.

Third, we find rows or lines composed entirely of this symbol, as in the so-called title page of the Manuscript Troano.

DISCUSSION AS TO PHONETIC FEATURES OF THE CHARACTERS.

It must be admitted, as heretofore intimated, that this question has not as yet been satisfactorily answered. Whether what is here presented will suffice to settle this point in the minds of students of American paleography is doubtful; nevertheless, it is believed that it will bring us one step nearer the goal for which we are so earnestly striving. Something is said on this subject in my former work,[2] which need not be repeated here.

As it is evident from the preceding list of characters that conventional signs and symbols, often nothing more than abbreviated pictographs, were used in many cases to designate objects and persons, the inference to be drawn, unless other evidence is adduced, is, that this method prevailed throughout. Nevertheless there is some evidence that at the date when these manuscripts were written Maya culture was in a transition state; that is to say, conventional symbols

[1] See Plates XVI* *b* and XVII* *c*, Manuscript Troano.

[2] Study of the Manuscript Troano, pp. 141–161.

were passing into true ideographs[1] and possibly into phonetic characters.

The lack of any satisfactory key to assist us in deciphering them makes it exceedingly difficult to decide how far this change had progressed. We are therefore left wholly to deductions to be drawn from the facts obtained by laborious comparisons of the various relations in which the characters are found and the uses which appear to be made of them in the manuscript.

It will be admitted without question that a large number of these characters are ideographs or conventional symbols, as distinguished from pictures, as, for example, most of those denoting the days, months, and cardinal points. I say most of these, as it is yet possible to learn from some of them the objects they were intended to represent, the characteristic features not being entirely lost, as the symbol for the day Cimi, the "death's head" or skull; that of the day Ymix, "the grain of maize;" that of the month Moan, "the head of the moo or ara," a species of parrot, &c.

It is also possible to show from the manuscripts themselves evidences of the changes from conventional pictographs to true or mnemonic symbols.

Take, for instance, the bird symbols on Plates 16, 17, and 18 of the Dresden Codex, presented in the preceding marginal figures numbered 24, 25, 26, 27, 28, and 33. If the determination be correct as given, it is apparent that, while one of the birds is indicated by the head as a symbol, the others are denoted by ideographs, or by phonetic characters bearing no resemblance to their forms or peculiar features. That numerous examples of this kind are to be found in these manuscripts will be admitted by all who have carefully studied them.

Another fact bearing upon this point is the difference between the Dresden Codex and the Manuscript Troano in regard to marking with symbols the things represented in the pictures. We fail to find in the former (unless that on Plate 30 be a possible exception) the earth or soil represented by any symbol, though frequently occurring in the latter and also occasionally in the Cortesian Codex. The symbol for wood or that appearing so often on wooden articles in the latter, and occasionally in the Cortesian Codex, is wanting in the Dresden Codex, though wooden articles are several times represented. From this we infer that the Manuscript Troano is a more recent production than the Dresden Codex, notwithstanding the evidences of greater skill in drawing and higher mathematical attainments shown in the latter.

[1] As the term "ideograph" is somewhat broad and comprehensive, it may be well enough to state that I use it as expressing that stage of symbolic writing where the picture characters have so changed that all resemblance to the objects they were originally intended to represent is lost, and therefore they can only be considered as mnemonic signs.

Before discussing the question of phonography we ask attention to one or two facts regarding Landa's alphabet which do not appear to have been previously noticed, yet have an important bearing on the subject.

The failure to reach any satisfactory results with this alphabet proves, beyond a reasonable doubt, that this author was mistaken as to the character of the Maya writing; yet the frequent occurrence in the manuscripts of most, if not all, of the elements he presents renders it certain that there is a basis of truth on which it rests. It is probable, therefore, if we can find the key to his method, we may, after all, obtain some satisfactory results by means of his alphabet.

I have already stated as my belief that—

> He has undertaken to pick out of their compound or syllabic characters the letter elements; hence it is that, while we find it impossible to decipher the manuscripts by using them, yet we find such frequent resemblances as to compel us to admit a fundamental relationship.[1]

This opinion I still believe to be correct, but was, until very recently, unable to get any positive evidence as to his method of obtaining these elements.

While examining the Cortesian Codex I came across (on Plate 17) the symbol for a turtle (the different varieties of which are shown in marginal figure No. 4), which is nothing more or less than an attempt to represent the head of the animal. In the more abbreviated form (*b*) I at once recognized Landa's A (compare with *c* and *d*, No. 4). As the Maya name of the turtle is *Ac* or *Aac* it is apparent that in this instance the old Spanish priest selected a symbol representing an object the name of which contains a single syllable having, as its chief letter element, A. As this symbol is simply a representation of the animal's head there is no reason to infer that it is phonetic; on the contrary, it is more reasonable to assume that it was used only as a conventional sign. It is possible that after long usage it may have been adopted as a phonetic character, though its exceedingly rare occurrence in the manuscripts (being found only in the Cortesian Codex and with the turtle figure) and the fact that it is seldom, if ever, used as part of a compound character would seem to forbid this idea.

Precisely the same method was adopted in obtaining his B, which is given in two forms, first as a foot print and second as a circle inclosing four circular dots. The first, as all are aware, is only a conventional sign and presumably not phonetic. The second may be phonetic, though apparently but an abbreviation of the first. In Plate 65*c* (see marginal No. 20) and Plate 41*c* the two forms are brought into such relation to each other as to show that the latter is used as a symbol to represent the idea conveyed by the first. The

[1] Study of the Manuscript Troano, by Cyrus Thomas, pp. 142, 143.

proof in these cases is too strong to admit of doubt and explains Landa's method of obtaining his B, which, as before stated, was by selecting the symbol of that which is denoted by a Maya word of one syllable having B as its chief letter element, *Be* being the Maya word for "way," "journey," "walking," &c.

The symbol for the cacao given above in marginal No. 22 contains his eleventh letter *Ca* twice and is probably that from which it was taken; likewise that of the *Kukuitz* or Quetzal (marginal No. 26) and of the *Kuch* or vulture (marginal No. 27*a*), each of which contains his *Ku*, being double in the former and single in the latter. I am as yet unable to trace these two symbols to their origin; we might suppose, from Landa's figure of the latter, that it was intended to represent a bird's nest containing eggs, but an examination of the symbol as found in the manuscript renders this conclusion doubtful.

The evidences of phonography are few and, as must be admitted, not entirely satisfactory; yet they are apparently sufficient to justify the somewhat general belief that the writing of the Mayas had reached that stage where characters are sometimes used to indicate sounds. That comparatively little advance had been made in this direction at the time of the conquest is possible; moreover there is nothing to justify the belief that they made use of true letters as Landa supposed. If they had a phonographic system of any kind it was very imperfect and was only in that primary stage in which syllables are represented by single characters and words of more than one syllable by compound characters. Judging by the changes observed in the relation of the parts of compound characters to one another, we conclude that the order of arranging these parts was not uniform or essential. It is also doubtful, if any of these characters are phonetic, whether the parts of the longer words were always written out in full. I am led to believe, from a few slight indications, that, in forming words of more than one syllable, they often used only the leading phonetic elements of the single words of which they are composed; in other words, that they followed the rebus method of the Mexicans.

Descending to particulars and examples, the following are, perhaps, the strongest proofs which can be presented on this point:

As there can no longer be any doubt that the symbols for the cardinal points have been ascertained and that those relating to the polar points are distinguishable from those relating to the equatorial points, we are justified in referring to them in this discussion. As each of the two assigned to the equatorial points contains the symbol for "sun" or "day" and as the two Maya words for these points—*Likin* or *Lakin* and *Chikin*—contain the Maya term for sun or day ("kin"), there is some reason for believing that the characters are phonetic. There is to be added to this evidence the fact that the

symbol of the month *Yaxkin* contains the same sun symbol. It would be somewhat remarkable to find the same single character in three different combinations, representing three different ideas expressed by words containing the same sound, yet having no reference to the sound.

It is now generally admitted by students of American paleography, on what appears to be satisfactory evidence, that symbol No. 7 of the preceding list, *Cab*, is used to signify "earth" or "land" and "honey," both of which are designated by the same Maya term, *Cab*. As there is no similarity in the things denoted the character is probably phonetic. The "bee" appears also to be frequently indicated by the same character with an affix, as may be seen by reference to the lower divisions of Plates III*—X* of the Manuscript Troano.

The symbol No. 9 (U) of the preceding list is found repeatedly on vases and also as a prefix to both simple and compound characters. As *U* in Maya signifies "moon," "vase," and certain pronouns and is also used as a euphonic particle before vowels, we are perhaps justified in concluding that the symbol is phonetic and denotes the word *U*. I am aware that neither Perez nor Dr. Brinton gives "vase" as one of the meanings of this word, yet its constant appearance on vessels seems to leave no doubt that Brasseur is correct. Even admitting that he is mistaken and that we are in error as to the signification of the symbol, its various uses justify the belief that it is phonetic.

The symbol No. 34 of the preceding list, which is supposed to be that of the god Ekchuah, is probably phonetic. The name of this deity is composed of two Maya words, *ek*, "black," and *chu*, "calabash," and hence signifies "the black calabash," and the form and coloring of the symbol are apparently intended to denote this signification. If this interpretation be correct it is phonetic, as there is nothing in or pertaining to the figure of the deity which corresponds with it, except the color.

If the interpretation given of the preceding symbols Nos. 22, 24, 26, 27*a*, and 33 be correct, there can be scarcely a doubt that they are phonetic. In the first—*cacau*, *cacauak*, or *cacauche*, the "cacao"—we see Landa's letter *Ca*, which is doubled in each of the three forms taken from the different codices. In the twenty-sixth—*Kukuitz*, the Quetzal—Landa's *Ku* is duplicated, as it should be if phonetic, while in 27*a*, *Kuch*, it appears but once. There is here also an additional evidence of phoneticism in the fact that, while one of the symbols used to denote this bird shows simply its head, and is surely not phonetic, the other is entirely different and bears no resemblance whatever to any feature or characteristic of the bird. Moreover, both parts of it are used in other combinations referring to entirely different things.

If my interpretation of No. 14 (*Xamach* or *Chimix*) be right, it is probably phonetic also. It is composed, as will be seen by reference to the figure, of two symbols closely resembling that for the day Ymix, except that the top portion of one is omitted. The resemblance in sound to a duplication of Ymix is apparent. The slight but permanent variation of the right hand portion from the usual Ymix symbol and the omission of the top portion of the left hand one are scarcely explainable on the supposition that they form simply a conventional sign; but if phonetic the reason is apparent, as the *m* sound is not repeated in the Maya name. This conclusion is strengthened by the fact that the month *Mac*, found in the last or bottom line of Plate 49, is precisely the same as the right portion of No. 14, with Landa's symbol for *Ca* added. This probably justifies us in concluding that the true name of this month is *Camach*, "the jaw" or "jaws," and that Landa's figure is simply a rude representation of the lips or mouth.

I have expressed the opinion[1] that the chief phonetic element of No. 8 (the stone symbol), if used to represent sound, is *p* or *pp*. This opinion seems to be confirmed by the fact that this character is found as a part of the symbol for the month *Pop* on Plate 50 of the Dresden Codex. (See the second character in the first transverse line below the day columns in the preceding Fig. 362.) The method of determining the months referred to in these plates of the codex has been given in the preceding part of this paper.

The interpretation given above of symbol No. 24 (the moo or ara) will probably be accepted by all students of these manuscripts, and if so its phonetic character must be conceded. That it is used in the place above alluded to (Dresden Codex, Plate 16*c*) to denote this bird is proved by the parallelism of the groups and the figure of the parrot under it. If we turn now to Plate 48 of this codex we observe that the second character of the first line below the day columns and the first character in the upper line of the lower group or square is, in each case, a bird's head. It is easily proved by means of the numeral series with which these are connected that they denote, in both cases, the month *Moan* (from the moo), proving that Brasseur's surmise was correct.[2] If the same bird is represented by two symbols, one pictorial and the other having no resemblance to any feature or character of the thing denoted, it is probable the latter is phonetic. This conclusion is strengthened in this case by the strong resemblance of the first part of No. 24 to the symbol for the month Mol.

I have shown above that the right portion of No. 20 of the list is Landa's letter B, and also that in the lower division of Plate 65,

[1] Study of the Manuscript Troano, p. 147.

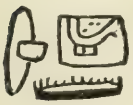
[2] Landa's Relacion, pp. 382, 383, Note 1.

Dresden Codex (see Fig. 378), it signifies "footsteps" or the act of walking. As the Maya word *Be* signifies "journey," "wood," "march," and also "journeying" and "marching," it is possible that this symbol is also phonetic, although apparently only a modified form of the footprint. This supposition is strongly supported by the fact that it is found in numerous and varied relations, single and in combination.

The symbol for 20 (*Kal*), No. 1 of the preceding list, is apparently phonetic. This view appears to be confirmed by its use otherwise than as a numeral symbol at several points in the text of the Manuscript Troano. For example, in the third division of Plate XVII* it appears in this form, while immediately below is the representation of an idol head in a vessel covered with a screen or basket, as shown in Fig. 388. The Maya verb

FIG. 388. Wooden idol in vessel with basket cover.

Kal signifies to "imprison" or "inclose," which is certainly appropriate to what we see in the figure. As the symbol is over each of the three similar figures in the division, it is probable that it is intended to denote something relating to or observable in them. In the second division of Plates XV* and XVI*, same codex, is this symbol, several times repeated, and below each the figure of a priest or deity at work, each carving, with a machete or hatchet, the head of an idol. The probable signification is "Give twice twenty strokes with a machete," and hence is but partially phonetic.



Other examples bearing on this question may be found, but these are believed to be sufficient to warrant the belief that at the time these codices were written Maya culture had reached that stage where the idea of phoneticism was being introduced into the writing. Yet it is certain, and even susceptible of demonstration, that a large portion, perhaps the majority, of the characters are symbols.

The more I study these characters the stronger becomes the conviction that they have grown out of a pictographic system similar to that common among the Indians of North America. The first step in advance appears to have been to indicate, by characters, the gesture signs.

SMITHSONIAN INSTITUTION—BUREAU OF ETHNOLOGY.

OSAGE TRADITIONS.

BY

REV. J. OWEN DORSEY.

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OSAGE TRADITIONS.

By Rev. J. Owen Dorsey.

INTRODUCTION.

When the author visited the Osage, in the Indian Territory, in January, 1883, he learned of the existence of a secret society of seven degrees, in which, it was alleged, the traditions of the people have been preserved to the present time. Owing to the shortness of his visit, one month and eleven days, he was unable to gain more than fragmentary accounts of the society, including parts of two traditions, from several Osage who had been initiated.

The version of the first tradition was dictated to the author by Haⱔa-o͡ŭ̧se (Red Corn), a halfbreed Osage of the Tsíou wactáᵸe gens. He obtained it from Saⱔekiᵹe. Haⱔa-o͡ŭ̧se was adopted in childhood by a white man named Matthews, who sent him to a Jesuit college in Missouri(?) to be educated for the priesthood. But the boy left the institution after he had been taught to read and write, as he did not wish to become a priest. He took the name of William P. Matthews, but among his white associates he is known as Bill Nix. He has tried several occupations and is now an Indian doctor. The author was inclined at first to underrate Mr. Matthews's accomplishments and stock of information, but subsequently changed his opinion of him, as he obtained much that agreed with what had been furnished by members of other tribes in former years. Besides, the author obtained partial accounts of similar traditions from other Osage, who used the same chant which Haⱔa-o͡ŭ̧se had sung. None of the younger Osage men knew about these matters and the author was urged not to speak to them on this subject. He observed that several of the elder men, members of the secret order in which these traditions are preserved, had parts of the accompanying symbolic chart (Fig. 389) tattooed on their throats and chests. This chart is a fac simile of one that was drawn for the author by Haⱔa-o͡ŭ̧se. At the top we see a tree near a river. The tree is a cedar, called the tree of life. It has six roots, three on each side. Nothing is said about this tree till the speaker nearly reaches the end of the tradition. Then

follows the "ceremony of the cedar." The tree is described very minutely. Then follows a similar account of the river and its branches.

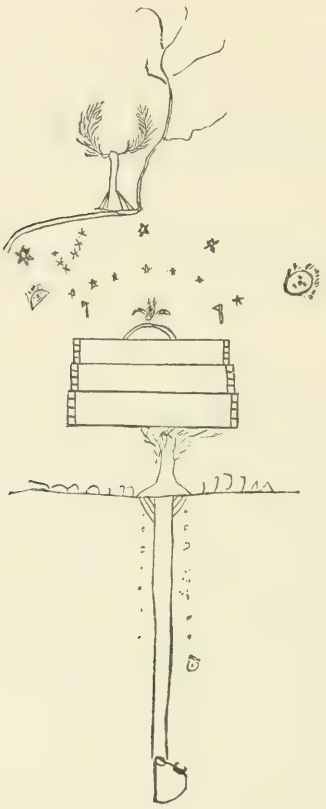

FIG. 389. Symbolic chart of the Osage.

Just under the river, at the left, we see a large star, the Red or Morning Star. Next are six stars, Taɸa**d**ɸi^{n}. The Omaha know a similar group, which they call "Mi^{n}xa si ɻañga," or "Large foot of a goose." Next is the Evening Star; and last comes the small star, "Mikak'ĕ-ɔiñxɻa." Beneath these four we see the seven stars, or Pleiades (Mikak'ĕ u**d**átse péɸũ^{n}**d**a, the Seven Gentes of Stars), between the Moon (on the left) and the Sun (on the right). Beneath these are the peace pipe (on the left) and the hatchet (on the right). A bird is seen hovering over the four upper worlds. These worlds are represented by four parallel horizontal lines, each of which, except the lowest one, is supported by two pillars. The lowest world rests on a red oak tree.

The journey of the people began at a point below the lowest upper world, on the left side of the chart. Then the people had neither human bodies nor souls, though they existed in some unknown manner.

They ascended from the lowest upper world, on the left, to the highest. There they obtained human souls in the bodies of birds, according to Saɗekiȼe. Ꝕahiꝉe-waɬayiñꝉa said that there they met a male red bird, to whom they appealed for aid. (See p. 383, line 18.) This was distinct from the female Red Bird, who gave them human bodies. They descended to the first world, and from that they traveled until they alighted on the red oak tree. (See p. 383, line 30.) The ground was covered with grass and other kinds of vegetation. Then the paths of the people separated: some marched on the left, being the peace gentes that could not take life; they subsisted on roots &c.; while those on the right killed animals. By and by the gentes exchanged commodities.

The small figures on the left, in going from the tree (on the right when facing the tree), show the heavenly bodies or beings to whom the Black Bear went for help, and those on the right, in going from the tree (on the left when facing the top of the chart), show similar bodies or beings to whom the Waɔaɔe or war gentes applied for assistance. These are unknown to the members of the Tsíɔu gentes. After the female red bird gave bodies to the Tsíɔu people, the Black Bear found seven skins, which were used for tents. Subsequently the people discovered four kinds of rocks, which were the I^{n}′qĕ sáɗe, or black rock; I^{n}′qĕ tu̯hu̯,[1] or blue (green?) rock; I^{n}′qĕ ɔüɬse, or red rock; and I^{n}′qĕ skă, or white rock. Therefore, when a child is named, four stones are heated for the sweat bath. After finding the rocks, according to Ꝕahiꝉe-waɬayiñꝉa, four buffalo bulls approached the people, as one of the men was returning to the company. When the first bull arose after rolling on the ground, an ear of red corn and a red pumpkin fell from his left hind leg. The leader of the Tsíɔu wactáꝉe noticed them, and asked his younger brother to pick them up and taste them. The leader of the Bald Eagle subgens did so. Then the elder brother said: "These will be good for the children to eat. Their limbs will stretch and increase in strength." When the second bull arose after rolling, an ear of spotted corn and a spotted pumpkin dropped from his left hind leg. These, too, were tasted and declared good for the children. When the third bull arose after rolling, an ear of dark corn and a dark (black?) pumpkin dropped from his left hind leg. From the left hind leg of the fourth buffalo dropped an ear of white corn and a white pumpkin. Therefore, when a child is named in the Tsíɔu gens (alone?) the head man of that gens (Ꝕahiꝉe-waɬayiñꝉa himself, according to his statement) takes a grain of each kind of corn and a slice of each variety of pumpkin, which he puts into the mouth of the infant. Haɗa-ɔüɬse knew that the four kinds of

[1] The sound of this inverted u̯, between o and u, as well as the sounds of other letters used in this article, except that of the inverted ɥ (which is a sound approximating ch in the German word ich), is to be found on page 206, Third Annual Report of the Bureau of Ethnology.

rocks were found, but he could not say in what part of the tradition the account belonged. He said that subsequently the Waɔaɔe and Tsíɔu gentes came to the village of the Hañ′ꞎa-utáɸanꞇse, a very warlike people, who then inhabited earth lodges. They subsisted on animals, and bodies of all kinds lay around their village, making the air very offensive. The Tsíɔu succeeded at last in making peace with the Hañ′ꞎa-utáɸanꞇse. After this followed the part of the account given to the author by ꞎahiꞎe-waꞇayiñꞎa:

"After the council between the Tsíɔu, Waɔaɔe, and Hañ′ꞎa-utáɸanꞇse, two old men were sent off to seek a country in which all might dwell. One of these was a Tsíɔu wactáꞎe and the other a Pa^{n}ꝗka-wactáꞎe. Each man received a pipe from the council and was told to go for seven days without food or drink. He carried a staff to aid him in walking. Three times a day he wept, in the morning, at noon, and near sunset. They returned to the people at the end of the seven days, being very thin. The report of the Tsíɔu man was accepted, so the Tsíɔu gens is superior to the Pa^{n}ꝗka-wactáꞎe or Watsetsi. A Waɔaɔe man acted as crier and told all about the new home of the nation. All the old men decorated their faces with clay. The next morning the two old men who had gone in search of the new home led their respective sides of the nation, who marched in parallel roads. When they reached the land the policemen ran around in a circle, just as they do previous to starting to war. The Waɔaɔe man ran around from right to left and the ɸuqe man from left to right. At different stations the two old leaders addressed the people. Finally the men took sharp pointed sticks, which they stuck into the ground, each one saying 'I wish my lodge to be here.' The next day the Cuka or messenger of the Tsíɔu old man went to summon the Elk crier. The latter was ordered to make a proclamation to all the people, as follows: 'They say that you must remove to-day! Wakanꞇa has made good weather! They say that you must remove to-day to a good land!' In those days the Osage used dogs instead of horses. When the old Tsíɔu man made his speech, he went into details about every part of a lodge, the fireplace, building materials, implements, &c. Four sticks were placed in the fireplace, the first pointing to the west. When this was laid down, the Tsíɔu leader spoke about the West Wind, and also about a young buffalo bull (Tseꞇu′-ɔiñꞎa), repeating the name Wani′e-skã. When the stick at the north was laid down, he spoke of Tsehe quꞇse (gray buffalo horns) or a buffalo bull. When the stick at the east was laid down he spoke of Tseꞇuꞎa tañꞎa (a large buffalo bull). On laying down the fourth stick at the south, he spoke of Tse mi^{n}ꞎa (a buffalo cow). At the same time a similar ceremony was performed by the aged Pa^{n}ꝗka man on the right side of the tribe.[1]

[1] It is probable, however, that the Pa^{n}ꝗka (Ponka) man began with the stick at the east, as he must use the right hand and foot first.

"In placing the stick to the east, Taꞇse ꓘaqpa tsĕ, The East Wind, and Tahe cade, Dark-Horned Deer, were mentioned; to the north, Taꞇse ꓛasaⁿ tsĕ, The North Wind, and The Deer with gray horns were mentioned; to the west, Taꞇse Maⁿ'ha tsĕ, The West Wind, and an animal which makes a lodge and is with the Tahe pasiꓘe were mentioned; to the south, Taꞇse Ak'a tsĕ, The South Wind, and Ta wañka he aꓘ¢aoĭ skutañꓘa were mentioned."[1]

ꓘahiꓘe-waꞇayiñꓘa gave no further information, as a reported case of smallpox near the agency led the author to start for the East February 21, 1883. Since then he has learned of the existence of similar societies among the Kansa and the Ponka, and he suspects that there were formerly such societies among the Omaha.[2]

TRADITIONS OF THE ELDERS.

In presenting the accompanying traditions, the following abbreviations are used in the interlinear translations:

an., *animate.*	in., *inanimate.*	pl., *plural.*	st., *sitting.*
cv., *curvilinear.*	mv., *moving.*	recl., *reclining.*	std., *standing.*
du., *dual.*	ob., *object.*	sing., *singular.*	sub., *subject.*

UNĔⁿ'UᵭÁMA. TSÍOU WACTÁMA ITÁᵭA.[3]

(Tradition of the Tsíou wactáꓘe gens.)

1 ↄiñ'ꓘa weháꓘi¢e[4]: áᵭiⁿtaú, Tsikáⁱ[5]
Child last he really said O grandfather!

Há, wisŭñ'ꓘa, ↄiñ'ꓘa ↄuíꓘa wa¢iñ'ꓘe, éꓘi añká[6]: áᵭiⁿtaú, Tsikáⁱ
Ho younger brother child body they have none he was saying that he really said O grandfather!

---

[1] Meaning uncertain: it may refer to the female or doe.

[2] See "Omaha Sociology," §§ 14–16, 19, 28, 33, 34, 36, 56, 143, 248–258, and passim, in Third Annual Report of the Director of the Bureau of Ethnology.

[3] The literal rendering of the title is "Growth told. Tsíou Peacemaker theirs." This may be translated freely by "Revelations of the elders of the Red Eagle gens."

[4] ↄiñ'ꓘa weháꓘi¢e, "The first end of the children" or "The beginning of the race." This reckoning was backward. The Ponka have a similar usage: uhañge, *an end*: uhañge pahañga tĕ, *the first end* or *beginning*. Ádiⁿtaú, formed by crasis from ade and iⁿtau, may refer to the words of the old men who have handed down these traditions. Tsiká is unintelligible to the younger Osage of the present day. One man told the author that he thought it meant, "O grandfather," being addressed to the principal Wakanꞇa. He said that it was substituted for another name of that being.

[5] The chorus or refrain at the end of each line is omitted in the free translation, as it would make confusion. If retained, the first four lines would read thus:

The first of the race: he really said, O grandfather!

He was saying, "Ho, younger brother! the children have no bodies": he really said, O grandfather!

"We shall seek bodies for our children": he really said, O grandfather!

"Ho, younger brother! you shall attend to it": he really said, O grandfather!

[6] Éꓘi añká refers to the preceding words, which were those of one of the mythic speakers. He was an ancestor of the Tsíou gens. Here he addressed his younger brother. At this time the brothers were destitute of human souls and bodies, though they possessed conscious existence and could talk, as well as move about from place to place.

Ọiñ′ʞa ɔuíʞa añʞúʞiʇse tatsé: á**d**i^{n}taú, Tsiká!
Child body we shall seek ours he really said O grandfather!

Há, wisŭñ′ʞa, úʇa^{n}**d**eɸaɸé tatsé: á**d**i^{n}taú, Tsiká!
Ho younger brother you shall attend to it he really said O grandfather!

Máxe úsakí**d**a[1] wi^{n}′qtsi ĕ′ʇsi hi′ naɔi^{n}′: á**d**i^{n}taú, Tsiká!
Parallel upper worlds one to it came and stood he really said O grandfather!

Ẹʇsíqtsi níkacíʞa-**d**áɔĭ[2]: á**d**i^{n}taú, Tsiká!
Just there they were not human beings he really said O grandfather!

Há wisŭñ′ʞa! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞe, éʞi añká: á**d**i^{n}taú, Tsiká!
Ho younger brother child body they have none he was saying that he really said O grandfather!

Ọiñ′ʞa ɔuíʞa añʞúʞiʇsé tatsé: á**d**i^{n}taú, Tsiká!
Child body we shall seeks ours he really said O grandfather!

Máxe úsakí**d**a ɸŭ^{n}′**d**a ĕ′ʇsi hi′ naɔi^{n}′: á**d**i^{n}taú, Tsiká!
Parallel upper worlds two to it came and stood he really said O grandfather!

Ẹʇsíqtsi níkacíʞa-**d**áɔĭ: á**d**i^{n}taú, Tsiká!
Just there they were not human beings he really said O grandfather!

Há, wisŭñ′ʞa! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞe, éʞi añká: á**d**i^{n}taú, Tsiká!
Ho younger brother child body they have none he was saying that he really said O grandfather!

Ọiñ′ʞa ɔuíʞa añʞúʞiʇsé tatsé: á**d**i^{n}taú, Tsiká!
Child body we shall seek ours he really said O grandfather!

Máxe úsakí**d**a ɸá**d**ɸi^{n} ĕ′ʇsi hi′ naɔi^{n}′: á**d**i^{n}taú, Tsiká!
Parallel upper worlds three there came and stood he really said O grandfather!

Ẹʇsíqtsi níkacíʞa-**d**áɔĭ: á**d**i^{n}taú, Tsiká!
Just there they were not human beings he really said O grandfather!

Há, wisŭñ′ʞa! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞe, éʞi añká: á**d**i^{n}taú, Tsiká!
Ho younger brother child body they have none he was saying that he really said O grandfather!

Ọiñ′ʞa ɔuíʞa añʞúʞiʇse tatsé: á**d**i^{n}taú, Tsiká!
Child body we shall seek ours he really said O grandfather!

Máxe úsakí**d**a ʇúda ĕ′ʇsi hi′ naɔi^{n}′: á**d**i^{n}taú, Tsiká![3]
Parallel upper worlds four there came and stood he really said O grandfather!

---

[1] See the lowest horizontal line on the left side of the chart.

[2] Níkacíʞa-**d**áɔĭ. Another reading is níkacíʞaqtsi-**d**áɔĭ: *they were not complete human beings.*

[3] A different reading of lines 17 to 25 is as follows:

Máxe úsakída ʇúda níkacíʞaɸáde: á**d**i^{n}taú, Tsiká!
Parallel upper worlds four they were made human beings he really said O grandfather!

Cŭ^{n}′ŭ^{n}ckíta é eɸá**d**i^{n}taú, Tsiká!
Awhile he said indeed, he really said O grandfather!

Ọiñ′ʞa ɔuíʞa waɸiñ′ʞade, é añká: á**d**i^{n}taú, Tsiká!
Child body they have none he was saying he really said O grandfather!

Há, wisŭñ′ʞa! é eɸá**d**i^{n}taú, Tsiká!
Ho younger brother! he said indeed, he really said O grandfather!

Úʇa^{n}de añʞáxe tatsé: á**d**i^{n}taú, Tsiká!
Attention we shall make he really said O grandfather!

Máxe úsakída ɸá**d**ɸi^{n} ĕ′ʇsi a^{n}tsí naɔi^{n}′: á**d**i^{n}taú, Tsiká!
Parallel upper worlds three there they (?) came and stood he really said O grand father!

Ĕɬsíqtsi níkacíʞa é[1]: a**đ**iⁿtaú, Tsiká!
Just there they were human beings he really said O grandfather!

Cŭⁿ′ŭⁿckíta ɔiñ′ʞa cuíʞa waɸiñ′ʞa**đ**e ɸañká: á**đ**iⁿtaú, Tsiká!
Awhile longer child body they were without he really said O grandfather!

ɔiñ′ʞa ɔuíʞa añʞúʞiɬse aⁿmaⁿ′ɸiⁿ tá**đ**etse: á**đ**iⁿtaú, Tsiká!
Child body we seek ours we shall walk he really said O grandfather!

Máxe úsakí**đ**a ɸá**đ**ɸⁿi ĕ′ɬsi tsi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Parallel upper worlds three there came this way and stood he really said O grandfather!

ɔiñ′ʞa ɔuíʞa-**đ**áɔĭ é eɸá**đ**iⁿtaú, Tsiká!
Child had no bodies that indeed, he really said O grandfather!

Há, wisŭñ′ʞa! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞe, éʞi añká: á**đ**iⁿtaú, Tsiká!
Ho younger brother child body they have none he was saying that he really said O grandfather!

ɔiñ′ʞa ɔuíʞa añʞúʞiɬse aⁿmaⁿ′ɸiⁿ tá**đ**etse: á**đ**iⁿtaú, Tsiká!
Child body we seek ours we shall walk he really said O grandfather!

Máxe úsakí**đ**a ɸŭⁿ′**đ**a ĕ′ɬsi tsi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Parallel upper worlds two there came this way and stood he really said O grandfather!

ɔiñ′ʞa ɔuíʞa kíiɸa-**đ**áɔĭ: á**đ**iⁿtaú, Tsiká!
Child body they did not find for he really said O grandfather!

Há, wisŭñ′ʞa! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞe, éʞi añká: á**đ**iⁿtaú, Tsiká!
Ho younger brother child body they have none he was saying that he really said O grandfather!

Cŭⁿ′ŭⁿckíta úɬaⁿ**đ**e añʞáxe tá**đ**etse: á**đ**iⁿtaú, Tsiká!
Awhile longer examination we shall make he really said O grandfather!

Máxe usakí**đ**a wiⁿ′qtsi ĕ′ɬsi tsi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Parallel upper worlds one there came this way and stood he really said O grandfather!

Pü′sühü wiⁿ átsi ánaɔiⁿ añká: á**đ**iⁿtaú, Tsiká!
Red oak one they came to and stood on he really said O grandfather!

ɔiñ′ʞa ɔuíʞa-**đ**áčĭ, é eɸá**đ**iⁿtaú, Tsiká!
Children had no bodies he said indeed, he really said O grandfather!

Cŭⁿŭⁿckíta úɬaⁿ**đ**e añʞáxe tatsé: á**đ**iⁿtaú, Tsiká!
Awhile longer attention we shall make he really said O grandfather!

Máxe úsakí**đ**a ɸŭⁿ**đ**a ĕ′ɬsi aⁿtsí naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Parallel upper worlds two there they (?) came and stood he really said O grandfather!

Translation.

At the fourth upper world they were made human beings.

"Still," said he (the elder brother?), indeed he really said,

"The children have no bodies.

"Ho, younger brother!

"We must give this matter our attention."

They came to the third upper world.

"The children have no bodies."

"Still must we give this our attention," said one.

They came to the second upper world. (From this line on there is no variation from what has been given above.)

[1]Here they obtained human souls, though they were in the bodies of birds. See the bird hovering above the four upper worlds in the chart. Then began the descent to this earth.

Hŭⁿ′**đ**a ɸáxɸiⁿqtsi ĕ′ɬsi tsi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Day very good there came and stood he really said O grandfather!

Káxe-wáhü-saⁿ[1] ɸé-na: á**đ**iⁿtaú, Tsiká!
Crow bone white he who was my in the past he really said O grandfather!

ɸútsi naɔiⁿ′ é eɸá**đ**iⁿtaú, Tsiká!
Came directly to him and stood he said indeed, he really said O grandfather!

Há, wiɔiⁿɸé: á**đ**iⁿtaú, Tsiká!
Ho elder brother! he really said O grandfather!

Cáxe ɬsüɬseaⁿ′ɸakcíɸĕ maⁿhmiⁿ′ tatsé[2]: á**đ**iⁿtaú, Tsiká!
Paws you burn them for me you shall walk he really said O grandfather!

Há, Káxe-wáhü-saⁿ! éxi añká: á**đ**iⁿtaú, Tsiká!
Ho crow bone white! he was saying that he really said O grandfather!

Wátse-ɬúxa-na[3] ĕ′ɬsi hi′ naɔiⁿ′ añká: á**đ**iⁿtaú, Tsiká!
Male animal who touched a foe in the past there he arrived and was standing he really said O grandfather!

Há, wítsixué! éxi añká: á**đ**iⁿtaú, Tsiká!
Ho grandfather! he was saying that he really said O grandfather!

Ɔiñ′xa ɔuíxa waɸiñ′xe añká: á**đ**iⁿtaú, Tsiká!
Child body they have none he really said O grandfather!

Ɔiñ′xa ɔuíxa miñkcé ɸan′tse[4]: á**đ**iⁿtaú, Tsiká!
Child body I who sit (?) apt he really said O grandfather!

Wákanɬá xána **đ**ɸiⁿ-máɔĭ[5], éxi añxá: á**đ**iⁿtaú, Tsiká!
Mysterious one that only I am I-not he was saying that he really said O grandfather!

Cŭⁿ′ŭⁿckíta úɬaⁿ**đ**eɸaɸé tatsé: á**đ**iⁿtaú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Wátse-miⁿ′xa-na ĕ′ɬsi hi′ naɔiⁿ′ añká: á**đ**iⁿtaú, Tsiká!
Female animal who had touched a foe in the past there he arrived and was std. he really said O grandfather!

Há, íuxué! éxi añká: á**đ**iⁿtaú, Tsiká!
Ho grandmother! he was saying that he really said O grandfather!

Ɔiñ′xa ɔuíxa waɸiñ′xe añká: á**đ**iⁿtaú, Tsiká!
Child body they have none he really said O grandfather!

Ɔiñ′xa ɔuíxa miñkcé ɸan′tse: á**đ**iⁿtaú, Tsiká!
Child body I who sit apt he really said O grandfather!

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[1] Why the Black Bear was called Káxe-wáhü-saⁿ was not explained to the author.

[2] Cáxe ɬsüɬseaⁿ′ ɸakcíɸĕ &c. *You shall take me for your servant;* literally, *You shall walk, causing me to burn my feet;* that is, *You shall make me go through fire and water for you.*

[3] Wátse-ɬúxa-na. Ɬuxa shows that the star was regarded as a male *animal*, just as miⁿ′xa, in line 43, denotes that the next star was a female *animal*, not a female of the human race. As they were called "grandfather" and "grandmother," they were looked upon as supernatural beings or gods. So were all of the heavenly bodies to whom the Black Bear applied.

[4] Ɔiñxa ɔuixa miñkce ɸan′tse, a phrase that puzzles the writer, who suspects that an auxiliary verb has been omitted and that the whole should read: "Ɔiñxa ɔuixa-wikciɸe miñkce ɸan′tse? *(Can I give you bodies for the children?)* No! You must still make attempts to obtain them elsewhere."

[5] Wákanɬá xána **đ**ɸiⁿ-máɔĭ, *I am not the only mysterious one* (apply to some one of the rest).

47 Wákaɴtą́ ɤ́ána **đ**¢i^{n}-mácĭ, éɤi añká: á**đ**i^{n}taŭ, Tsiká!
Mysterious one | that only | I am | I-not | she was saying that | he really said | O grandfather!

Cŭ^{n}′ŭ^{n}ckíta úɬa^{n}**đ**e¢a¢é tatsé: á**đ**i^{n}taú, Tsiká!
Awhile longer | you shall attend to it | he really said | O grandfather!

Ha^{n}′**đ**a-ɬa^{n} wákaɴtą́ ¢iñkcĕ′ɬsi hi′ naɔi^{n}′: á**đ**i^{n}taú, Tsiká!
During the day | mysterious one | to the ob. | he arrived and stood | he really said | O grandfather!

Há, wítsiɤué! éɤi añká: á**đ**i^{n}taú, Tsiká!
Ho | grandfather! | he was saying that | he really said | O grandfather!

51 Ɔiñ′ɤa ɔuíɤa wa¢ iñ′ɤa**đ**e, wítsiɤué, éɤi añká: á**đ**i^{n}taú, Tsiká!
Child | body | they have none | grandfather! | he was saying that | he really said | O grandfather!

Ɔiñ′ka ɔuíɤa miñkcé ¢an′tse: á**đ**i^{n}taú, Tsiká!
Child | body | I who sit | apt | he really said | O grandfather

Wákaɴtą́ ɤ́ána **đ**¢i^{n}-máɔĭ, éɤi añká: á**đ**i^{n}taú, Tsiká!
Mysterious one | that | I am | I-not | he was saying that | he really said | O grandfather!

54 Cŭ^{n}ŭ^{n}ckítá úɬa^{n}**đ**e¢a¢é tatsé: á**đ**i^{n}taú, Tsiká!
Awhile | you shall attend to it | he really said | O grandfather!

Wákaɴtą́ ha^{n}′ ¢iñkcí ĕ′ɬsi hi′ naɔi^{n}′: á**đ**i^{n}taú, Tsiká!
Mysterious one | night | the st. ob. | there | he arrived and stood | he really said | O grandfather!

Ɬá, wítsiɤué! á**đ**i^{n}taú, Tsiká!
Ho | grandfather! | he really said | O grandfather!

57 Ɔiñɤa cuíɤa wa¢iñ′ɤa**đ**e, wítsiɤué, eɤi añká: á**đ**i^{n}taú, Tsiká!
Child | body | they have none | grandfather! | he was saying that | he really said | O grandfather!

Ɔiñ′ɤa ɔuíɤa miñkcé ¢an′tse: á**đ**i^{n}taú, Tsiká!
Child | body | I who sit | apt | he really said | O grandfather!

Wákaɴtą́ ɤ́ána **đ**¢i^{n}-máɔĭ, éɤi añká: á**đ**i^{n}taú, Tsiká!
Mysterious one | that only | I am | I-not | he was saying that | he really said | O grandfather!

60 Cŭ^{n}′ŭ^{n}ckíta úɬa^{n}**đ**e¢a¢é tatsé: á**đ**i^{n}taú, Tsiká!
Awhile longer | you shall attend to it | he really said | O grandfather!

Mikák'ĕ pé¢ŭ^{n}**đ**a[1] ¢iñkcí ĕ′ɬsi tsi′naɔi^{n}′: á**đ**i^{n}taú, Tsiká!
Star | seven | the cv. ob. | to it | he came and stood | he really said | O grandfather!

Há, wítsiɤué! á**đ**i^{n}taú, Tsiká!
Ho | grandfathers! | he really said | O grandfather!

63 Ɔiñka ɔuíɤa wa¢iñ′ɤa**đ**e, wítsiɤué, éɤi añká: á**đ**i^{n}taú, Tsiká!
Child | body | they have none | grandfathers! | she was saying that | he really said | O grandfather!

Ɔiñ′ɤa ɔuíɤa miñkcé ¢an′tse: á**đ**i^{n}taú, Tsiká!
Child | body | I who sit | apt | he really said | O grandfather!

Wákaɴtą́ ɤ́ána **đ**¢i^{n}-máɔĭ, éɤi añká: á**đ**i^{n}taú, Tsiká!
Mysterious one | that only | I am | I-not | he was saying that | he really said | O grandfather!

66 Cŭ^{n}′ŭ^{n}ckíta úɬa^{n}**đ**e¢a¢é tatsé: á**đ**i^{n}taú, Tsiká!
Awhile longer | you shall attend to it | he really said | O grandfather!

[1] Mikák'ĕ pé¢ŭ^{n}đa, sometimes called "Mikák'ĕ uđátse pé¢ŭ^{n}đa," the Seven Gentes of Stars. Could this have any connection with the use of the number 7 as the number of the Tsiɔu, Waɔaɔe, and Hañɤa gentes?

67 Tá ɸa**ɖ**ɸi^{n} ɸiñkcĕ'ɬsi tsi' naɔi^{n}': á**ɖ**i^{n}taú, Tsiká!
Deer three to the st. an. object he came and stood he really said O grandfather!

Há, wítsiʞué! á**ɖ**i^{n}taú, Tsiká!
Ho grandfather! he really said O grandfather!

69 Ɔiñ'ʞa ɔuíʞa waɸiñ'ʞa**ɖ**e, wítsiʞué, éʞi añká: á**ɖ**i^{n}taú, Tsiká!
Child body they have none grandfather he was saying that he really said O grandfather!

Ɔiñ'ʞa ɔuíʞa miñkcé ɸan'tse: á**ɖ**i^{n}taú, Tsiká!
Child body I who apt he really said O grandfather!

Wákanɬá ʞána **ɖ**ɸi^{n}-máɔĭ, éʞi añká: á**ɖ**i^{n}taú, Tsiká!
Mysterious one that only I am I-not he was saying that he really said O grandfather!

72 Cŭ^{n}'ŭ^{n}ckíta úɬa^{n}**ɖ**eɸaɸé tatsé: á**ɖ**i^{n}taú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Mikák'ĕ tañ'ʞa ha^{n}'**ɖ**a-ɬa^{n}' ɸiñkci' ĕ'ɬsi tsi' naɔi^{n}': á**ɖ**i^{n}taú, Tsiká!
Star large during the day the st. ob. there he came and stood he really said O grandfather!

Há, wítsiʞué! á**ɖ**i^{n}taú, Tsiká!
Ho grandfather! he really said O grandfather!

75 Ɔiñ'ʞa ɔuíʞa waɸiñ'ʞa**ɖ**e, wítsiʞué, éʞi añká e: á**ɖ**i^{n}taú, Tsiká!
Child body they have none grandfather he was saying that that he really said O grandfather!

Ɔiñ'ʞa ɔuíʞa miñkcé ɸan'tse: á**ɖ**i^{n}taú, Tsiká!
Child body I who apt he really said O grandfather!

Wákanɬá ʞána **ɖ**ɸi^{n}-máɔĭ, éʞi añká: á**ɖ**i^{n}taú, Tsiká!
Mysterious one that only I am I-not he was saying that he really said O grandfather!

78 Cŭ^{n}'ŭ^{n}ckíta úɬa^{n}**ɖ**eɸaɸé tatsé: á**ɖ**i^{n}taú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Mikák'ĕ-ɔiñ'ʞa ɸiñkci' ĕ'ɬsi tsí naɔi^{n}': á**ɖ**i^{n}taú, Tsiká!
Star small the st. an. ob. there he came and stood he really said O grandfather!

Há, wítsiʞué! á**ɖ**i^{n}taú, Tsiká!
Ho grandfather! he really said O grandfather!

81 Ɔiñ'ʞa ɔuíʞa waɸiñ'ʞa**ɖ**e, wítsiʞué, éʞi añká: á**ɖ**i^{n}taú, Tsiká!
Child body they have none grandfather he was saying that he really said O grandfather!

Ɔiñ'ʞa ɔuíʞa miñkcé ɸan'tse: á**ɖ**i^{n}taú, Tsiká!
Child body I who apt he really said O grandfather!

Wákanɬá ʞána **ɖ**ɸi^{n}-máɔĭ, éʞi añká: á**ɖ**i^{n}taú, Tsiká!
Mysterious one that only I am I-not he was saying that he really said O grandfather!

84 Cŭ^{n}'ŭ^{n}ckíta úɬa^{n}**ɖ**eɸaɸé tatsé: á**ɖ**i^{n}taú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Waɔiñ'ʞa ɔü'ɬse ɸe-ná tsíhe uʞíʞɸi^{n}ɬtsi ɸiñkcé: á**ɖ**i^{n}taú, Tsiká!
Bird red the one my. in the past nest she was sitting in her own he really said O grandfather!

Ĕ'ɬsi hi' naɔi^{n}' añká: á**ɖ**i^{n}taú, Tsiká!
There he arrived and was standing he really said O grandfather!

87 Há, iɳʞú! é añká: á**ɖ**i^{n}taú, Tsiká!
Ho grandmother! he was saying he really said O grandfather!

88 Ɔiñ′ɤa ɔuíɤa waɸiñ′ɤaɗe, éɤi añká: áɗi^{n}taú, Tsiká![1]
Child body they have none he was saying that he really said O grandfather!

Ɔiñ′ɤa ɔuíɤawíɤiɸe ɸan′tsé, é ɸiñkcé: áɗi^{n}taú, Tsiká!
Child I cause you to have my body apt she was saying as she sat he really said O grandfather!

90 Ahü-sáɤi ɤáɸiñkcé ɔiñ′ɤa áhü-sáɤi ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Wing hard that one child wing hard shall walk he really said O grandfather!

Áhü-sáɤi amá ɸiñkcé ɔiñ′ɤa áhü-sáki tatsé: áɗi^{n}taú, Tsiká!
Wing hard the other one child wing hard shall (be) he really said O grandfather!

Taqpü′ ɤáɸiñkcé ɔiñ′ɤa taqpü′ ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Crown of the head that cv. ob. child crown of the head shall walk he really said O grandfather!

93 Íɸetsĕ ɤáɸiñkcé ɔiñ′ɤa íɸetsĕ ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Mouth that cv. ob. child mouth shall walk he really said O grandfather!

Pé ɸéɸiñkcé ɔiñ′ɤa pé ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Forehead this cv. ob. child forehead shall walk he really said O grandfather!

Táhütse ɤáɸiñkcé ɔiñ′ɤa táhütse ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Neck that cv. ob child neck shall walk he really said O grandfather!

96 Wéɸahni^{n} ɤáɸiñkcé ɔiñ′ɤa wéɸahni^{n} ma^{n}ɸi^{n}′ tatsé: áɗi^{n}taú, Tsiká!
Gullet that cv. ob. child gullet shall walk he really said O grandfather!

Mañ′ɤe ɤáɸiñkcé ɔiñ′ɤa mañ′ɤe tatsé: áɗi^{n}taú, Tsiká!
Chest that cv. ob. child chest shall (be) he really said O grandfather!

ɸ'ü′we-uqɸúk'a ɤáɸiñkcé ɔiñ′ɤa ɸü′we-uqɸúk'a tatsé: áɗi^{n}taú, Tsiká!
Bowels that cv. ob. child bowels shall (be) he really said O grandfather!

99 Ɔéɤutañ′ɤa ɤáɸiñkcé ɔiñ′ɤa ɔéɤutañ′ɤa tatsé: áɗi^{n}taú, Tsiká!
Thighs that cv. ob. child thighs shall (be) he really said O grandfather!

Cíɸanɬse ɤáɸiñkcé ɔiñ′ɤa cíɸanɬse tatsé: áɗi^{n}taú, Tsiká!
Knee that cv. ob. child knee shall (be) he really said O grandfather!

Náqpü ɤáɸiñkcé ɔiñ′ɤa náqpü tatsé: áɗi^{n}taú, Tsiká!
Calf of leg that cv. ob. child calf of leg shall (be) he really said O grandfather!

102 Síɸeɬse ɤáɸiñkcé ɔiñ′ɤa síɸeɬse tatsé: áɗi^{n}taú, Tsiká!
Heel that cv. ob. child heel shall (be) he really said O grandfather!

Sipá ɤáɸiñkcé ɔiñ′ɤa sipá tatsé: áɗi^{n}taú, Tsiká!
Toe that cv. ob. child toe shall (be) he really said O grandfather!

Sípu-itáxe ɤáɸiñkcé ɔiñ′ɤa sípu-itáxe tatsé: áɗi^{n}taú, Tsiká!
Tip of toe that cv. ob. child tip of toe shall (be) he really said O grandfather!

105 Ɔiñ′ɤa its'é ɸiñkĕ′ɸtsi ma^{n}hni^{n}′ táɗetsé: áɗi^{n}taú, Tsiká!
Child cause of death without any at all ye shall walk he really said O grandfather!

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[1] ɤahiɤe-waɬayiñɤa, of this gens, gave the following as another reading:
,)iñ′ɤa níkacíɤa ɸiñkɤé-eɬa^{n}, cuɗɸé eɸaú, witsiɤué! áɗi^{n}taú, Tsiká!
Child human beings none as I go to you indeed O grandfather! he really said O grandfather!

Translation.

As the children are not human beings, I go to you, O grandfather!

106 ɔiñ′ɤa ¢aníkacíɤa ma^{n}hni^{n}′ tá**d**etsé: á**d**i^{n}taú, Tsiká!
Children — you are human beings — you shall walk — he really said — O grandfather!

ɔiñ′ɤa únia^{n} ɤá¢iñkcé ɔiñ′ɤa únia^{n}′wíkci¢ĕ: á**d**i^{n}taú, Tsiká!
Child — speech (?) — that — child — I cause you to speak (?) — he really said — O grandfather!

The rest of this tradition was not obtained.

Translation.

The following translation is arranged in lines to correspond to the lines in the original text:

The first of the race
Was saying, "Ho, younger brother! the children have no bodies.
"We shall seek bodies for our children.
"Ho, younger brother! you shall attend to it."
They reached one upper world and stood.
There they were not human beings.
"Ho, younger brother! the children have no bodies," he was saying.
"We must seek bodies for our children."
They reached the second upper world and stood.
There they were not human beings.
"Ho, younger brother! the children have no bodies," he was saying.
"We must seek bodies for our children."
They reached the third upper world and stood.
There they were not human beings.
"Ho, younger brother! the children have no bodies," he was saying.
"We must seek bodies for our children."
They reached the fourth upper world and stood.
There they became human beings.
Still, the children were without (human) bodies.
"We must continue to seek bodies for our children."
They returned to the third upper world and stood.
The children were really without bodies.
"Ho, younger brother! the children have no bodies," he was saying.
"We must continue to seek bodies for our children."
They returned to the second upper world and stood.
The children did not find bodies for themselves.
"Ho, younger brother! the children have no bodies," he was saying.
"We must make an examination awhile longer."
They returned to the first upper world and stood.
They came to a red oak and were standing on it.
On a very fine day they came hither and stood.
Kaxe-wahü-sa^{n} (the Black Bear), who was then moving,
Came directly to them and stood.
"Ho, elder brother!" (said the Black Bear.)
"You shall continue to burn my feet for me."
"Ho, Kaxe-wahü-sa^{n}!" was he (the Tsiɔu) saying.
Kaxe-wahü-sa^{n} went to the star Watse-ɻuɤa.
"Ho, grandfather!" he was saying.
"The children have no bodies."
Watse-ɻuɤa replied, "Can I give the children bodies?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then Kaxe-wahü-sa^{n} went to the star Watse-mi^{n}ɤa.

"Ho, grandmother!" he said;
"The children have no bodies."
She replied, "Can I give bodies to the children?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the mysterious one of day.
"Ho, grandfather!" said he;
"The children have no bodies."
Said he, "Can I give the children bodies?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the mysterious one of night.
"Ho, grandfather!" said he;
"The children have no bodies, grandfather!"
The Moon replied, "Can I give bodies to the children?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the Pleiades, saying,
"Ho, grandfathers!
"The children have no bodies."
One of these replied, "Can I give bodies to the children?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the constellation called Three Deer.
"Ho, grandfather," said he;
"The children have no bodies."
The latter replied, "Can I give the children bodies?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the Morning Star, saying,
"Ho, grandfather!
"The children have no bodies."
The star replied, "Can I give bodies to the children?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
Then he went to the Small Star, saying,
"Ho, grandfather!
"The children have no bodies."
The star replied, "Can I give bodies to the children?
"I am not the only mysterious one;
"You shall attend to it awhile longer."
The female Red Bird, who had been moving, was sitting on her nest.
To her he came, saying,
"Ho, grandmother!
"The children have no bodies."
She replied, "I can cause your children to have (human) bodies from my own.
"My left wing shall be a left arm for the children.
"My right wing shall be a right arm for them.
"My head shall be a head for them.
"My mouth shall be a mouth for them.
"My forehead shall be a forehead for them.
"My neck shall be a neck for them.
"My throat shall be a throat for them.
"My chest shall be a chest for them.

98 "My bowels shall be bowels for them.
"My thighs shall be thighs for them.
"My knees shall be knees for them.
"The calves of my legs shall be calves of their legs.
102 "My heels shall be their heels.
"My toes shall be their toes.
"My claws shall be their toenails.
105 "You shall continue to exist without any cause of destruction for your race.
"Your children shall live as human beings.
"The speech (or breath) of children will I bestow on your children."

UNĈⁿ' UĢÁKE. QÜĢÁPASAⁿ ITÁdE.[1]

(Tradition of the Bald Eagle subgens.)

1 ʔiñ'ɬa níɥk'ăcíɬa táđeɬaⁿ úɬaⁿđe añɬáxe tatsé. wísŭñɬá:
Child human beings in order that (pl.) attention we shall make younger brother

áđiⁿtaú. Tsiká!
he really said O grandfather!

Káxe-wáhü-saⁿ tsi' naciⁿ': áđiⁿtaú. Tsiká!
Káxe-wáhü-saⁿ came and stood he really said O grandfather!

3 Káxe-wáhü-saⁿ' haⁿ'đa-ɬaⁿ wakaŋ'ɬa ɸiñkcéɬsi hi'naɔiⁿ': áđiⁿtaú.
Káxe-wáhü-saⁿ during the day mysterious one to the st. an, ob. came and stood he really said

Tsiká!
O grandfather!

[1] This fragment of the tradition of the Bald Eagle subgens of the Tsiɔu wactaɬe gens was told by Pahü-skă, the chief, to Hađa-oüɬse, who related it to the writer on the following day.

Hađa-oüɬse told some of the tradition first in English, but on chanting it in Osage he did not give all; so the former account is now given in these notes: "When the ancestors of the Bald Eagle people came to this earth they alighted on a sycamore tree, as all of the surrounding country was under water. This water was dried up by the ancestors of the Elk people, according to the tradition of the Ųpqaⁿ or Elk gens; but this is disputed by the members of the Idats'ĕ gens, who are Kansa or Wind people. They say that their ancestors blew on the water, drying it up and causing the growth of vegetation. As soon as the water was gone the Bald Eagle people alighted on the ground. Then they met the Black Bear, who offered to become the servant of the Tsiɔu wactaɬe people. So he was sent to Watse-ɬuɬa, who was a red star; then to Watse-miⁿɬa, a star near the Morning Star; then to the Sun, Moon, and Seven Stars. As the people journeyed, the Black Bear said to the Tsiɔu leader, 'Brother, I see a man's trail. Here is the man.' The stranger said, 'I am a young Hañɬa. I am fit for work.' So they took him with them. Then they saw another trail, of which the Black Bear spoke to the Tsíɔu leader. They overtook the man, who was Hañɬaqtsi or Real Hañɬa. By and by they reached the village of the Hañɬa utaɸanɬse. They entered the village and made peace with the inhabitants. Then the leader of the Hañɬa utaɸanɬse said, 'We have some people come to us, and we will make them our chiefs.' So the two wactaɬe were made chiefs. The wactaɬe were then sent to search for a land where they might dwell, as the village of the Hañɬa utaɸanɬse was filthy and offensive on account of the dead bodies in and around it. This council was the first one of the whole nation. The two wactaɬe went out as mourners for seven days. The Hañɬa wactaɬe (Paⁿɥka= Ponka came back first, saying, 'I have found a place.' Afterwards the Tsiɔu wactaɬe returned and reported. The council was held again to decide to which

Há, wítsiᵸuéʼ! ɔiñʼᵸa ɔuíᵸa waɸiñʼᵸaɖe, éᵸi añká: áɖiⁿtaú, Tsiká!
Ho grandfather! child body they have none he was saying that he really said O grandfather!

Wakanʼɬa uɔañʼᵸe tsʼé watséqi ɖɸiⁿʼ eɸaú: áɖiⁿtaú, Tsiká!
Mysterious one road to die difficult I am indeed he really said O grandfather!

Wakanʼɬa ᵸána ɖɸiⁿ-máɔi, éᵸiᵸíe añká: áɖiⁿtaú, Tsiká!
O mysterious one that only I am I-not he was saying to him what precedes he really said O grandfather!

Cŭⁿʼŭⁿckíta úɬaⁿɖeɸaɸé tatsé: áɖiⁿtaú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Káxe-wáhü-saⁿʼ, cŭⁿʼta, wisŭñʼᵸa, úɬaⁿɖe añᵸáxe táɖetsé: áɖiⁿtaú,
Káxe-wáhü-saⁿʼ awhile longer (?) my younger brother attention we must make he really said

Tsiká!
O grandfather!

Watsé-ɬúᵸa ɸiñkcí ĕʼɬsi hiʼ naɔiⁿʼ: áɖiⁿtaú, Tsiká!
Male animal that touched a foe the std. to it an. ob. arrived and stood he really said O grandfather!

Há, wítsiᵸuéʼ! ɔiñʼᵸa ɔuíᵸa waɸiñʼᵸaɖe, éᵸi añká: áɖiⁿtaú, Tsiká!
Ho grandfather! child body they have none he was saying that he really said O grandfather!

Wakanʼɬa uɔañʼᵸe tsʼé watséqi ɖɸiⁿʼ eɸaú: áɖiⁿtaú, Tsiká!
Mysterious one road to die difficult I am indeed he really said O grandfather!

Wakanʼɬa ᵸána ɖɸiⁿ-máɔi, éᵸiᵸíe añká: áɖiⁿtaú, Tsiká!
Mysterious one that only I am I-not he was saying to him what precedes he really said O grandfather!

Cŭⁿʼŭⁿckíta úɬaⁿɖeɸaɸé tatsé: áɖiⁿtaú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Káxe-wáhü-saⁿʼ, cŭⁿʼta, wisuñʼᵸa, úɬaⁿɖe añᵸáxe táɖetsé: áɖiⁿtaú,
Káxe-wáhü-saⁿʼ awhile longer my younger brother attention we must make he really said

Tsiká!
O grandfather!

Wáɖaha ɸiñkcĕʼɬsi hiʼ naɔiⁿʼ: áɖiⁿtaú, Tsiká!
Bier to the st. an. ob. arrived and stood he really said O grand father!

Há, wítsiᵸuéʼ! ɔiñʼᵸa ɔuíᵸa waɸiñʼᵸaɖe, éᵸi añká: áɖiⁿtaú, Tsiká!
Ho grandfather! child body they have none he was saying that he really said O grandfather!

Wákanʼɬá uɔañʼᵸe tsʼé watséqi ɖɸiⁿʼ eɸaú: áɖiⁿtaú, Tsiká!
Mysterious one road to die difficult I am indeed he really said O grandfather!

Wákanʼɬá ᵸána ɖɸiⁿ-máɔi, éᵸiᵸíe añká: áɖiⁿtaú, Tsiká!
Mysterious one that only I am I-not he was saying to him what precedes he really said O grandfather!

Cŭⁿʼŭⁿckíta úɬaⁿɖeɸaɸé tatsé: áɖiⁿtaú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

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place they would go. They agreed to settle at the place visited by the Tsiɔu wactaᵸe. Then four standards were made by members of the Waɔaɔe (wanŭⁿ gens, two for each side of the tribe. These were the standards made of miⁿxa ha (swan or goose skins), and they were carried on the hunting road as well as on the war path. But the otter skin standards were always retained by the Waɔaɔe gens."

On comparing this version with that of Saɖekiɸe we notice that in one or the other a transposition of some parts has been made. In this latter tradition the appeals to the heavenly bodies and to the Red Bird were made before the journey to the four revolutions of the upper worlds.

Káxe-wáhü-saⁿ′, cŭⁿ′ta, wisŭñ′ʞa, ŭʇaⁿ**đ**e añʞáxe táđetsé: á**đ**iⁿtaú,
Káxe-wáhü-saⁿ′ awhile longer my younger brother attention we must make he really said

Tsiká!
O grandfather!

Ⱡaɥ′pa ɸiñkcĕ′ʇsi hi′ naciⁿ′: á**đ**iⁿtaú, Tsiká!
Circle to the st. an. ob. arrived and stood he really said O grandfather!

Há, wítsiʞué! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞa**đ**e, éʞi añká: á**đ**iⁿtaú, Tsiká!
Ho grandfather! child body they have none he was saying that he really said O grandfather!

Wakan′ʇa uɔañ′ʞe ts'é watséqi **đ**ɸiⁿ′ eɸaú: á**đ**iⁿtaú, Tsiká!
Mysterious one road to die difficult I am indeed he really said O grandfather!

Wakan′ʇa ʞána **đ**ɸiⁿ-máɔĭ, éʞiʞíe añká: á**đ**iⁿtaú, Tsiká!
Mysterious one that only I am I-not he was saying to him what precedes he really said O grandfather!

Cŭⁿ′ŭⁿckíta úʇaⁿ**đ**eɸaɸé tatsé: á**đ**iⁿtaú, Tsiká!
A while longer you shall attend to it he really said O grandfather!

Káxe-wáhü-saⁿ′, cŭⁿ′ta, wisŭñ′ʞa, úʇaⁿ**đ**e añʞáxe táđetsé:
Káxe-wáhü-saⁿ′ awhile longer my younger brother attention we must make

á**đ**iⁿtaú, Tsiká!
he really said O grandfather!

Mikák'ĕ haⁿ′**đ**a-ʇaⁿ ɸiñkcí ĕ′ʇsi hi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Star by day the st. an. ob. at it arrived and stood he really said O grandfather!

Há, wítsiʞué! ɔiñ′ʞa ɔuíʞa waɸiñ′ʞa**đ**e, éʞi añká: á**đ**iⁿtaú, Tsiká!
Ho grandfather! child body they have none he was saying that he really said O grandfather!

Wakan′ʇa uɔañ′ʞe ts'é watséqi **đ**ɸiⁿ′ eɸaú: á**đ**iⁿtaú, Tsiká!
Mysterious one road to die difficult I am indeed he really said O grandfather!

Wakan′ʇa ʞána **đ**ɸiⁿ-máɔĭ, éʞiʞíe añká: á**đ**iⁿtaú, Tsiká!
Mysterious one that only I am I-not he was saying to him what precedes he really said O grandfather!

Cŭⁿ′ŭⁿckíta úʇaⁿ**đ**eɸaɸé tatsé: á**đ**iⁿtaú, Tsiká!
Awhile longer you shall attend to it he really said O grandfather!

Káxe-wáhü-saⁿ′, cŭⁿ′ta, wisŭñ′ʞa, úʇaⁿ**đ**e añʞáxe táđetsé: á**đ**iⁿtaú,
Káxe-wáhü-saⁿ′ awhile longer younger brother attention we must make he really said

Tsiká!
O grandfather!

Waɔiñ′ʞa cü′ʇse ɸiñkcĕ′ʇsi hi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Bird red to the st. an. ob. he arrived and stood he really said O grandfather!

Há, iɥʞú! á**đ**iⁿtaú, Tsiká!
Ho grandmother! he really said O grandfather!

ɔiñ′ʞa ɔuíka waɸiñ′ʞa**đ**e, éʞi añká: á**đ**iⁿtaú, Tsiká!
Child body they have none he was saying that he really said O grandfather!

(Here some lines are wanting. See the other version for the appeal to the Red Bird and her reply.)

Haⁿ′**đ**a maɔaⁿ′ uɸáʞɸiⁿ ɸiñkcĕ′ʇsi hi′ naɔiⁿ′: á**đ**iⁿtaú, Tsiká!
Day land good at the st. an. ob. he arrived and stood he really said O grandfather!

Máxe úʞawiⁿ′xe ʇúđa ɸiñkcé ĕ′ʇsi aⁿníɥkᵓăciⁿ′ʞa: á**đ**iⁿtaú, Tsiká!
Upper world gyration four the ev. in. ob. there we were people he really said O grandfather!

38 Aⁿníɥkʻăciⁿʼɤa ɔuíɤa añkíi¢a-**d**áɔĭ: á**d**iⁿtaú Tsiká!
We were people body we did not find for ourselves he really said O grandfather!

Máxe úɤawiⁿʼxe wé¢ŭⁿ**d**a ĕʼɬsi aⁿtsiʼ naɔiⁿʼ: á**d**iⁿtaú, Tsiká!
Upper world gyration the second there they arrived and stood he really said O grandfather!

Ĕʼɬsi aⁿníɥkʻăciⁿɤa-**d**áɔĭ: á**d**iⁿtaú, Tsiká!
There we were not human beings he really said O grandfather!

Máxe úɤawiⁿʼxe wé¢a**d**¢iⁿ ĕʼɬsi aⁿtsiʼ naɔiⁿʼ: á**d**iⁿtaú, Tsiká!
Upper world gyration the third there they arrived and stood he really said O grandfather!

42 Ĕʼɬsi aⁿníɥkʻăciⁿʼɤa-**d**áɔĭ: á**d**iⁿtaú, Tsiká!
There we were not human beings he really said O grandfather!

Máxe úɤawiⁿʼxe wéɬu**d**a ĕʼɬsi aⁿtsiʼ naɔiⁿʼ: á**d**iⁿtaú, Tsiká!
Upper world gyration the fourth there they arrived and stood he really said O grandfather!

Ɔaⁿsaⁿʼ aⁿtsiʼ naɔiⁿʼ: á**d**iⁿtaú, Tsiká!
Sycamore they came and stood (on) he really said O grandfather!

45 Maɔaⁿʼ utañʼɤa ¢iñkcé ĕʼɬsi aⁿtsiʼ naɔiⁿʼ: á**d**iⁿtaú, Tsiká!
Harvest time the there they arrived and stood he really said O grandfather!

Há, wísŭñɤaé! níɥkʻăciⁿʼɤa wiⁿʼ siɤ¢á**d**e tsé: á**d**iⁿtaú, Tsiká!
Ho younger brother! person one has left a trail he really said O grandfather!

Há, wíɔiⁿ¢é! níɥkʻăciⁿʼɤa siɤ¢á**d**e tsé éca**d**iʼ-na, níɥkʻăciⁿʼɤa
Ho elder brother! person has left a trail you have said person

¢íakqá: á**d**iⁿtaú, Tsiká!
this is he he really said O grandfather!

48 Há, wíɔiⁿ¢é![1] Hañʼɤa ɔiñʼɤa **d**¢iⁿʼ eɕaú: á**d**iⁿtaú, Tsiká!
Ho elder brother! Hañʼɤa young I am indeed he really said O grandfather!

Há, wísŭñɤaé! níɥkʻăciⁿʼɤa wiⁿ siɤ¢á**d**e tsé: á**d**iⁿtaú, Tsiká!
Ho younger brother! person one has left a trail he really said O grandfather!

Há, wíɔiⁿ¢é! níɥkʻăciⁿʼɤa siɤ¢á**d**e tsé éca**d**iʼ-na, níɥkʻăciⁿɤa
Ho elder brother! person has left a trail you have said person

¢íakqá: á**d**iⁿtaú, Tsiká!
this is he he really said O grandfather!

51 Há, wíɔiⁿ¢é! Waɔáɔe **d**¢iⁿʼ eɕaú: á**d**iⁿtaú, Tsiká!
Ho elder brother! Osage I am indeed he really said O grandfather!

Hañʼɤa aⁿníɥkʻăciⁿʼka tatsé: á**d**iⁿtaú, Tsiká!
Hañʼɤa we shall be people he really said O grandfather!

Níɥkʻăciⁿʼka ɬʻu**d**a siɤ¢á**d**e tsé: á**d**iⁿtaú, Tsiká!
People some left a trail he really said O grandfather!

54 Hañʼɤa utáɕanɬse tsí iɥtá**d**e, é eɕaú: á**d**iⁿtaú, Tsiká!
Hañʼɤa apart from the rest lodge theirs that indeed he really said O grandfather!

Há! níɥkʻăcíⁿka ɬʻú**d**a tsiʼ añká: á**d**iⁿtaú, Tsiká!
Ho persons some have come he really said O grandfather!

Tsíɔu Wátsetsi iɥá**d**e tsiʼ añká: á**d**iⁿtaú, Tsiká!
Tsíɔu Wátsetsi also have come he really said O grandfather!

57 Ɔiñʼɤa uwáqta eɕéɤi añká: á**d**iⁿtaú, Tsiká!
Child what is good for them they decided (?) he really said O grandfather!

[1] Here is where the two roads begin.

58 ↄiñ′ᴋa ᴋíwatañ′ᴋa ma^{n}¢i^{n} tatsé, e¢éᴋi añká: á**d**i^{n}taú, Tsiká!
Child being chiefs over them they two shall walk they decided (?) he really said O grandfather!

ↄiñ′ᴋa íts'e ¢iñᴋé ma^{n}¢i^{n}′ tatsé, e¢éᴋi añká: á**d**i^{n}taú, Tsiká!
Child without cause of death they two shall walk they decided (?) he really said O grandfather!

60 ↄiñ′ᴋa uᴋístu ĕ′ɬsí ¢iñᴋcé tatsé: á**d**i^{n}taú, Tsiká!
Child assembly there it shall be he really said O grandfather!

ↄiñ′ᴋa uníuk'ăc^{n}′ᴋa tá**d**e maɔa^{n}′ u¢áᴋiɬse tatsé: á**d**i^{n}taú, Tsiká!
Child to become men in in order that land you two shall seek your he really said O grandfather!

ↄiñ′ᴋa uníuk'ăci^{n}′ᴋa tá**d**e-ɬa^{n}′ maɔa^{n}′ ĕ′ɬsi ¢iñkcé ᴋáxe añká:
Child to become men in in order that land it is there they have made

á**d**i^{n}taú, Tsiká!
he really said O grandfather!

63 ↄá**d**e[1] mi^{n}′ᴋa ¢é-na ĕ′ɬsi ka^{n}′ha hí ᴋ¢i^{n} añká: á**d**i^{n}taú, Tsiká!
Beaver female animal the mv. an. obs. in the past there border reached and was sitting he really said O grandfather!

Tsíhe ↄiñ′ᴋa
Lodge small

Translation.

1 "O younger brother! we must see what can be done to make human beings of the children."
The Black Bear came to them and stood.
3 He went to the mysterious one of day, saying,
"Ho, grandfather! the children have no bodies."
He replied, "I have an everlasting road (in which I must keep);
6 I am not the only mysterious one;
You must still seek for help."
(On reporting to the leader, the latter said,)
"O Kaxe-wahü-sa^{n}, my younger brother! we must still see what can be done."
9 So the Black Bear went to the star Watse-ɬuᴋa. saying,
"Ho, grandfather! the children have no bodies."
He replied, "I have an everlasting road (in which I must keep);
12 "I am not the only mysterious one;
"You must still seek for help."
(On reporting to the leader, the latter said),
"O Kaxe-wahü-sa^{n}, my younger brother! we must still see what can be done."
15 So the Black Bear went to the Bowl of the Great Dipper, saying,
"O grandfather! the children have no bodies!"
He replied, "I have an everlasting road (in which I must keep);
18 "I am not the only mysterious one;
"You must still seek for help."
(On reporting to the leader, the latter said),
"O Kaxe-wahü-sa^{n}, my younger brother! we must still see what can be done."
21 Then he went to the Seven Stars, saying,
"Ho, grandfather! the children have no bodies."
He replied, "I have an everlasting road (in which I must keep);
24 "I am not the only mysterious one;
"You must still seek for help."

[1] At this point begins the account of the Female Beaver. She was an ancestor of the Osage, according to a statement published in Long's Expedition to the Rocky Mountains.

(On reporting this to the leader, the latter said),
" O Kaxe-wahü-sa^{n}, my younger brother! we must still see what can be done."
So he went to the Morning Star, saying,
" Ho, grandfather! the children have no bodies."
He replied, " I have an everlasting road (in which I must keep);
" I am not the only mysterious one;
" You must still seek for help."
(On reporting this to the leader, the latter said),
" O Kaxe-wahü-sa^{n}, my younger brother! we must still see what can be done."
So he went to the Red Bird, who was sitting (on her nest), saying,
" Ho, grandmother!
The children have no bodies."

* * * * * * *

They went to the good land of day.
In four revolutions or gyrations of the upper worlds, we became human beings.
Though we were human beings, we did not find bodies.
They arrived at the second revolution of the upper worlds.
There we were not (complete) human beings.
They arrived at the third revolution of the upper worlds.
There we were not (complete) human beings.
They arrived at the fourth revolution of the upper worlds
They stood on a sycamore tree.
They stood there at harvest time.
" Ho, younger brother! a man has left a trail."
" Ho, elder brother!" said the Black Bear; " you have said that a man has left a trail.
" This is the man."
" Ho, elder brother!" (said the stranger) "I am Young Hañɬa."
[Tsiɔu.] " Ho, younger brother! a man has left a trail."
[Black Bear.] " Ho, elder brother! you have said that a man has left a trail.
" This is the man."
" Ho, elder brother!" (said the stranger) " I am Osage.
" We shall be Hañɬa people."
Some people left a trail.
Those were the lodges of the Hañɬa utaɕanɬse.
(The Hañɬa utaɕanɬse leader said)
" Ho! some persons have come.
" Tsiɔu and Watsetsi have come."
They thought of what was good for the children.
They decided that the two should continue as chiefs for the children.
They decided that the two should continue without anything that would be fatal to the children. (And they said)
" There shall be an assembly of the children.
" You two shall seek a land in which the children may become men."
They two arranged for the location of a land in order that the children might become men in it.
The Female Beaver, who had been traveling, came to the confines of the village (of the Hañɬa utaɕanɬse?)
(She made?) a small lodge (for herself?).

Good Voice, of the Mi^{n}k'i^{n} gens, knew the history of the Female Beaver, but he failed to keep his promise to dictate it to the author.

CONCLUDING REMARKS.

An Osage said to the author: "We do not believe that our ancestors were really animals, birds, &c., as told in the traditions. These things are only wa-wi′-ku-ska′-ye [symbols] of something higher." On saying this he pointed to the sky.

Apart from such traditions or myths, it is found that even the taboos and the names of the gentes, subgentes, phratries, and persons are objects of mysterious reverence among many, if not all, of the Siouan tribes. Such names are never used in ordinary conversation. This is especially the case in tribes where the secret society continues in all its power, as among the Osage, the Ponka, and the Kansa. When the author was questioning these Indians he was obliged to proceed very cautiously in order to obtain information of this character, which was not communicated till they learned about his acquaintance with some of the myths. When several Dakota delegations visited Washington he called on them and had little trouble in learning the names of their gentes, their order in the camping circle, &c., provided the interpreters were absent. During his visit to the Omaha, from 1878 to 1880, he did not find them very reticent in furnishing him with such information, though he was generally referred to the principal chief of each gens as the best authority for the names in his own division. But he found it very difficult to induce any of them to admit that the gentes had subdivisions, which were probably the original gentes. It was not till 1880, and after questioning many, that by the merest accident he obtained the clew from the keeper of a sacred pipe.

The Iowa, who have these social divisions and personal names of mythic significance, also have sacred songs, but these are in the Winnebago language. It is probable that they are the property of a secret order, as they, too, show how some of the gentes descended as birds from the upper world. The names of the Winnebago gentes and of some members of the tribe have been recorded by the author, who has also learned parts of their traditions. He infers that their secret society has not been abolished.

When a man of the Kansa tribe observed that the author had an inkling of the matter he related part of the tradition of that tribe, explaining the origin of the names and the taboos of several Kansa gentes. The ancestors of these gentes were spoken of as birds which descended from an upper world. The phratries in that tribe, the "Wa-yŭ^{n} mi^{n}-′dŭ^{n}," or "(Those who) sing together," refer to mystic songs and strengthen the view that the secret society exists among these Indians. Several members of the tribe have positively stated its existence.

As one phratry is composed of the two gentes, Large and Small

Hañka, that have the sole right to sing the war songs, time may show that these songs, which, with their chart of pictographs, are used by the Osage, are substantially those of the seventh degree in the Osage society. This is rendered the more probable by the fact that the Kansa have grouped their gentes in seven phratries, just the number of the degrees in the society. And this arrangement by sevens is the rule among Osage, Kansa, Ponka, Omaha, and Dakota, though there are apparent exceptions.

Further investigation may tend to confirm the supposition that in any tribe which has mythic names for its members and its social divisions (as among the Osage, Kansa, Quapaw, Omaha, Ponka, Iowa, Oto, Missouri, Tutelo, and Winnebago), or in one which has mythic names only for its members and local or other names for its social divisions (as among the Dakota, Assiniboin, Mandan, Hidatsa, and Crow), there are now or there have been secret societies or "The Mysteries."

[1]See the author's paper in the American Naturalist for 1885, entitled "Kansas mourning and war customs," with which was published part of the chart mentioned above.

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THE CENTRAL ESKIMO.

BY

DR. FRANZ BOAS

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THE CENTRAL ESKIMO.

By Dr. Franz Boas

INTRODUCTION.

The following account of the Central Eskimo contains chiefly the results of the author's own observations and collections made during a journey to Cumberland Sound and Davis Strait, supplemented by extracts from the reports of other travelers. The geographical results of this journey have been published in a separate volume.[1] A few traditions which were considered unsuitable for publication by the Bureau of Ethnology may be found in the Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, 1887. The linguistic material collected during the journey will be published separately.

Owing to unfortunate circumstances, the larger portion of the author's collections could not be brought home, and it has therefore been necessary, in preparing this paper, to make use of those made by C. F. Hall, 1860–1862 and 1865–1869; W. Mintzer, 1873–'74, and L. Kumlien, 1877–'78. Through the kindness of Professor Otis T. Mason, I was allowed to make ample use of the collections of the National Museum and have attached its numbers to the specimens figured. The author's collection is deposited in the Museum für Völkerkunde at Berlin. I am indebted to the American Museum of Natural History; to Mr. Appleton Sturgis, of New York; to Captain John O. Spicer, of Groton, Conn.; and to Mrs. Adams, of Washington, D. C., for several figures drawn from specimens in their possession.

[1] Baffin-Land. Geographische Ergebnisse einer in den Jahren 1883 und 1884 ausgeführten Forschungsreise. Von Dr. Franz Boas. (Ergänzungsheft No. 80 zu „Petermanns Mitteilungen".) Gotha: 1885.

AUTHORITIES QUOTED.

In citing the various authorities, I have used abbreviations as indicated at the end of titles in the following list of works consulted:

De | Martini | Forbisseri | Angli navigati | one in regiones occi | dentis et septen | trionis | Narratio historica, | Ex Gallico sermone in La | tinum translata | per | D. Joan. Tho. Freigivm. | [Design.] | Cum gratia & privilegio Imperiali. cıↃ. ıↃ. xxc. [Colophon:] Noribergæ | Imprimebatur, in officina Ca | tharinæ Gerlachin, & Hære | dum Iohannis Mon | tani. Anno cıↃ ıↃ xxc. (Cited, Frobisher.)

A | voyage of discovery, | made under the orders of the Admiralty | in | His Majesty's ships | Isabella and Alexander, | for the purpose of | exploring Baffin's Bay, | and inquiring into the probability of a | north-west passage. | By John Ross, K. S. Captain Royal Navy. | London: | John Murray, Albemarle-street. | 1819. (Cited, Ross I.)

Journal | of a voyage for the discovery of a | north-west passage | from the Atlantic to the Pacific; | performed in the years 1819–20, | in His Majesty's ships | Hecla and Griper, | under the orders of | William Edward Parry, R.N., F.R.S., | and commander of the expedition. | With an appendix, containing the scientific | and other observations. | Published by authority of the lords commissioners | of the admiralty. | London: | John Murray, | publisher to the admiralty, and board of longitude. | 1821. (Cited, Parry I.)

Journal | of a | second voyage for the discovery of a | north-west passage | from the Atlantic to the Pacific; | performed in the years 1821–22–23, | in His Majesty's ships | Fury and Hecla, | under the orders of | Captain William Edward Parry, R.N., F.R.S., | and commander of the expedition. | Illustrated by numerous plates. | Published by authority of the lords commissioners | of the admiralty. | London: | John Murray, | publisher to the admiralty, and board of longitude. | 1824. (Cited, Parry II.)

The | private journal | of | Captain G. F. Lyon, | of H. M. S. Hecla, | during | the recent voyage of discovery under | Captain Parry. | With a map and plates. | London: | John Murray, Albemarle-Street. | 1824. (Cited, Lyon.)

A | brief narrative | of | an unsuccessful attempt | to reach | Repulse Bay, | through | Sir Thomas Rowe's "Welcome," | in | His Majesty's ship Griper, | in the year | 1824. | By Captain G. F. Lyon, R. N. | With a chart and engravings. | London: | John Murray, Albemarle street. | 1825. (Cited, Lyon, Attempt to reach Repulse Bay.)

Narrative | of a | second voyage in search of | a | north-west passage, | and of a | residence in the Arctic regions | during the years 1829, 1830, 1831, 1832, 1833. | By | Sir John Ross, C. B., K. S. A., K. C. S., &c. &c. | captain in the Royal Navy. | Including the reports of | Commander, now Captain, James Clark Ross, R. N., F. R. S., F. L. S., &c. | and | The Discovery of the Northern Magnetic Pole. | London: | A. W. Webster, 156, Regent street. | 1835. (Cited, Ross II.)

A narrative | of some passages in the history of | Eenoolooapik, | a young Esquimaux who was brought to Britain in 1839, in the ship "Neptune" | of Aberdeen. | An account of the | discovery of Hogarth's Sound: | remarks on the northern whale fishery, | and suggestions for its improvement, &c. &c. | By Alexander M'Donald, L. R. C. S. E. | Member of Cuvieran Natural History Society of Edinburgh. | Edinburgh: Fraser & Co. | And J. Hogg, 116 Nicolson Street, | 1841. (Cited, Eenoolooapik.)

Narrative | of | the discoveries | on | the north coast of America; | effected by the | officers of the Hudson's Bay Company | during the years 1836–39. | By Thomas Simpson, esq. | London: | Richard Bentley, New Burlington Street. | Publisher in Ordinary to Her Majesty | 1843. | (Cited, Dease and Simpson.)

Narrative | of an | expedition to the shores | of | the Arctic sea | in 1846 and 1847. | By John Rae, | Hudson Bay Company's service, commander of the expedition. | With maps. | London: | T. & W. Boone, 29, New Pond Street. | 1850. (Cited, Rae I.)

Further papers | relative to the Recent Arctic expeditions | in search of | Dr. John Franklin, | and the crews of | H. M. S. "Erebus" and "Terror." | Presented to both houses of Parliament by command of Her Majesty, | January, 1855. | London: | Printed by George Edward Eyre and William Spottiswoode, | Printers to the Queen's most excellent Majesty. | For Her Majesty's stationery office. | 1855. (Cited, Rae II.)

Same volume: Observations on the Western Esquimaux and the country they inhabit; from Notes taken during two years at Point Barrow, by Mr. John Simpson, Surgeon R. N., Her Majesty's Discovery Ship "Plover." (Cited, Simpson.

The voyage of the 'Fox' in the Arctic seas. | A narrative | of the | discovery of the fate | of | Sir John Franklin | and | his companions. | By Captain M'Clintock, R. N., LL.D. | honorary member Royal Dublin Society. | [Portrait.] | With maps and illustrations. | London: | John Murray, Albemarle street, | publisher to the admiralty. | 1859. (Cited, M'Clintock.)

Life with the Esquimaux: | a narrative of Arctic experience in search of | survivors of Sir John Franklin's | Expedition. | By | Captain Charles Francis Hall, | of the whaling barque "George Henry," | From May 29, 1860, to September 13, 1862. | Popular Edition. | With Maps, | Coloured illustrations, and one hundred wood cuts. | London: | Sampson Low, son, and Marston, | Milton House, Ludgate Hill. | 1865. (Cited, Hall I.)

Tales and traditions | of the | Eskimo | with a sketch of | their habits, religion, language | and other peculiarities | by | Dr Henry Rink | knight of Dannebrog | Director of the Royal Greenland board of trade, and | formerly Royal Inspector of South Greenland | author of 'Grönland geographik og | statistick beckrevest, etc. | Translated from the Danish by the author | Edited by | Dr Robert Brown | F. L. S., F. R. G. S. | author of 'The races of mankind,' etc. | With numerous illustrations, drawn and | engraved by Eskimo | William Blackwood and Sons | Edinburgh and London | 1875. | All rights reserved. (Cited, Rink.)

Eskimoiske | Eventyr og Sagn | oversatte | efter de indfødte fortælleres opskrifter | og meddelelser | af | H. Rink, | inspektør i Sydgrønland. | Kjøbenhavn. | C. A. Reitzels Boghandel. | Louis Kleins Bogtrykkeri. | 1866. (Cited, Rink, Eventyr og Sagn.)

Eskimoiske | Eventyr og Sagn. | Supplement | indeholdende | et Tillæg om Eskimoerne | af | H. Rink. | Kjøbenhavn. | C. A. Reitzels Boghandel. | Louis Kleins Bogtrykkeri. | 1871. (Cited, Rink, Eventyr og Sagn, Supplement.)

Narrative | of the | second Arctic expedition | made by | Charles F. Hall: | his voyage to Repulse Bay, sledge journeys to the Straits [*sic*] of Fury | and Hecla and to King William's Land, | and | residence among the Eskimos during the years 1864–'69. | Edited under the orders of the Hon. Secretary of the Navy, | by | Prof. J. E. Nourse, U. S. N. | U. S. Naval Observatory, | 1879. | Trübner & Co., | Nos. 57 and 59 Ludgate Hill, | London. (Cited, Hall II.)

Als Eskimo unter den Eskimos. | Eine Schilderung der Erlebnisse | der | Schwatka'schen Franklin-Aufsuchungs-Expedition | in den Jahren 1878–80. | Von | Heinrich W. Klutschak, | Zeichner und Geometer der Expedition. | Mit 3 Karten, 12 Vollbildern und zahlreichen in den Text gedruckten Illustrationen | nach den Skizzen des Verfassers. | Wien. Pest. Leipzig. | A. Hartleben's Ver lag. | 1881. | Alle Rechte vorbehalten. (Cited, Klutschak.)

Schwatka's Search | sledging in the Arctic in quest of | the Franklin records | By | William H. Gilder | second in command | with maps and illustrations | London | Sampson Low, Marston, Searle, and Rivington | Crown Buildings, 188, Fleet Street. | All rights reserved. (Cited, Gilder.)

Eskimoisches Wörterbuch, | gesammelt | von den Missionaren | in | Labrador, | revidirt und herausgegeben | von | Friedrich Erdmann. | Budissin, | gedruckt bei Ernst Moritz Monse. | 1864. (Cited, Wörterbuch des Labradordialectes.)

David Cranz | Historie | von | Grönland | enthaltend | Die Beschreibung des Landes und | der Einwohner &c. | insbesondere | die | Geschichte | der dortigen | Mission | der | Evangelischen | Brüder | zu | Neu-Herrnhut | und | Lichtenfels. | Mit acht Kupfertafeln und einem Register. | Barby bey Heinrich Detlef Ebers, und in Leipzig | in Commission bey Weidmanns Erben und Reich. | 1765. (Cited, Cranz.)

Bruchstükke | eines Tagebuches, | gehalten in | Grönland | in den Jahren 1770 bis 1778 | von | Hans Egede Saabye, | vormaligem ordinierten Missionar in den Destrikten Claushavn | und Christianshaab, jetzigem Prediger zu Udbye | im Stifte Fühnen. | Aus dem Dänischen übersetzt | von | G. Fries, | beabschiedigtem königlich dänischen Capitaine. | Mit einer Vorrede des Uebersetzers, | enthaltend einige Nachrichten von der Lebensweise der | Grönländer, der Mission in Grönland, samt andern damit | verwandten Gegenständen, und einer Karte | über Grönland. | Hamburg. | Bey Perthes und Besser. | 1817. (Cited, Egede.)

Baffin-Land. | Geographische Ergebnisse | einer | in den Jahren 1883 und 1884 ausgeführten Forschungsreise. | Von | Dr. Franz Boas. | Mit zwei Karten und neun Skizzen im Text. | (Ergänzungsheft No. 80 zu „Petermanns Mitteilungen".) | Gotha: Justus Perthes. | 1885. (Cited, Baffin-Land.)

Die Amerikanische | Nordpol-Expedition | von | Emil Bessels. | Mit zahlreiche Illustrationen in Holzschnitt, Diagrammen und | einer Karte in Farbendruck. | Leipzig. | Verlag von Wilhelm Engelmann. | 1879. (Cited, Bessels.)

Contributions | to the | Natural History | of | Arctic America, | made in connection with | the Howgate Polar expedition, 1877–'78, | by | Ludwig Kumlien, | Naturalist of the expedition. | Washington: | Government Printing Office. | 1879.

Report | of the | Hudson's Bay expedition, | under the command of | Lieut. A. R. Gordon, R. N., | 1884.

Traditions indiennes | du | Canada nord-ouest | par Émile Petitot | Ancien missionnaire. | Paris | Maisonneuve frères et Ch. Leclerc, | 25, Quai Voltaire, | 1886.

The following is a list of the papers published by the author on the results of his journey to Baffin Land and of studies connected with it. The ethnological remarks contained in these brief communications have been embodied in the present paper. The method of spelling in the first publications differs from that applied in the present paper. It was decided to use the latter after a conference with Dr. H. Rink.

"Reiseberichte aus Baffin-Land." Berliner Tageblatt, August 4, October 28, November 4, November 25, 1883; September 28, October 19, November 2, November 9, November 16, November 23, December 28, 1884; January 4, April 3, April 27, 1885.

"Unter dem Polarkreise." New-Yorker Staats-Zeitung, February 1, February 22, March 2, 1885.

"The configuration of Ellesmere Land." Science, February 27, 1885.

"A journey in Cumberland Sound and on the west shore of Davis Strait in 1883 and 1884, with map." Bull. Am. Geogr. Soc., pp. 241–272, 1884.

"Die Wohnsitze und Wanderungen der Baffin-Land Eskimos." Deutsche geogr. Blätter, p. 31, 1885.

"Cumberland Sound and its Esquimaux." Popular Science Monthly, p. 768, May, 1885.

"Die Eskimos des Baffin-Landes." Verh. des V. deutschen Geographentags zu Hamburg. Berlin, 1885.

"Reise im Baffinlande, 1883 und 1884." Verh. der Ges. für Erdkunde zu Berlin. 1885, Nos. 5, 6.

"Die Sagen der Baffin-Land Eskimos." Verh. der Berlin. anthrop. Gesellschaft, 1885, p. 161.

"The Eskimo of Baffin Land." Transactions of the Anthropological Society of Washington, Vol. 3, pp. 95–102.

"Sammlung aus Baffin-Land." Original Mittheilungen aus der ethnol. Abtheilung der Kgl. Museen zu Berlin, 1886, p. 131.

ORTHOGRAPHY.

In the spelling of Eskimo words the author has adhered as closely as possible to Kleinschmidt's orthography, as he did not deem it proper to introduce a linguistic alphabet after so much has been published in another and almost sufficient one.

Accents and lengths have been marked where it seemed to be desirable. In quotations Eskimo words are spelled according to this system where it is possible to recognize their meaning and derivation. In other cases the original spelling of the authors has been retained. The alphabet used in this paper is as follows:

Vowels: a—a in father.
e—ey in they.
i—ee in feel.
o—o in nose.
u—oo in pool.
au—ow in how.
ai—i in hide.

Consonants: q—a hard, guttural sound (Kleinschmidt's ĸ).
r—the German guttural r.
rn—a guttural and nasal r.
χ—the German ch in Buch; Scotch ch in loch.
g—English g in go.
k—English k.
ng—English ng in during.
b—English b.
p—English p.
v—pronounced with the lips only.
f—pronounced with the lips only.
m—English m.
d—English d.
t—English t.
s—English s in soul.
n—English n.
(g)dl—ḍ of Lepsius's standard alphabet.
(g)dtl—ṭ of Lepsius's standard alphabet.
l—English l.
j—German j in jung; English y.
ss—š of Lepsius's standard alphabet, sounding between s and sh.

GEOGRAPHY OF NORTHEASTERN AMERICA.[1]

The Eskimo inhabit almost the whole extent of the coast of Arctic America. A large part of this country is occupied by the Central Eskimo, one of the great groups into which that people is divided. They live in the northeastern part of the continent and on the eastern islands of the Arctic-American Archipelago. In Smith Sound they inhabit the most northern countries visited by man and their remains are even found at its northern outlet. The southern and western boundaries of this district are the countries about Fort Churchill, the middle part of Back River, and the coast west of Adelaide Peninsula. Along the whole extent of this line they are the neighbors of Indian tribes, with whom they are generally on very bad terms, a mutual distrust existing between the two races.

The geography of the whole country is known only in outline, and a great portion of it awaits its explorer. Following is a sketch of what is known about it, so far as it is of importance to the ethnologist.

The vast basin of Hudson Bay separates two large portions of the American continent: Labrador and the region of the large Arctic rivers. The southern shore of the bay is inhabited by Indian tribes who interrupt the communication between the Eskimo of both regions. Hudson Bay, however, has the character of a true mediterranean sea, the northern parts of its opposite shores being connected by a number of islands and peninsulas. The low and narrow Rae Isthmus, which presents an easy passage to the Arctic Ocean, unites Melville Peninsula to the main body of the continent. From this peninsula Baffin Land stretches out toward the north of Labrador, with only two narrow channels intervening: Fury and Hecla Strait and Hudson Strait. Another chain of islands, formed by the parts of Southampton Island and Mansfield Island, stretches from Repulse Bay to the northwest point of Labrador, but the distances between the islands and the roughness of the sea prevent communication.

On the western part of the continent the great bays, Chesterfield Inlet and Wager River, are of importance, as they allow the Eskimo, though they are a coast people, to penetrate into the interior of the continent. A narrow isthmus separates the head of the bays from the lakes of Back River. At Coronation Bay the latter approaches the Arctic Ocean very closely, and it is probable that the coast west of Adelaide Peninsula, which is skirted by innumerable islands, is indented by deep inlets extending towards the lakes of Back River. Thus communication between the Arctic Ocean and Hudson Bay is facilitated by this large river, which yields an abundant supply of fish. From Wager River an isthmus leads to its estuary.

Boothia Felix, the most northern peninsula of the continent, is united to it by two narrow isthmuses, the former extending from

[1] A glossary of Eskimo geographic terms will be found on p. 662

Pelly Bay to Shepherd Bay, the latter from Lord Mayor Bay to Spence Bay. It is separated from North Somerset by the narrow Bellot Strait. Farther west Adelaide Peninsula and King William Land form the continuation of the continent toward the western extremity of Boothia, thus outlining a spacious bay sheltered from the currents and the pack ice of Melville Sound and the adjoining bays. The eastern sides of Boothia and North Somerset and the western coasts of Melville Peninsula and Baffin Land form a gulf similar to Fox Basin.

Farther north, between Baffin Land and Greenland, North Devon and Ellesmere Land are situated. Thus Baffin Land forms a connecting link for three regions inhabited by Eskimo: the Hudson Bay Territory, Labrador, and Greenland.

The orography of the western coast of Hudson Bay is little known. Most of this coast seems to form a hilly land, consisting generally of granite. Between Wager River and Chesterfield Inlet it rises to a chain of hills of about one thousand feet in height, extending to a plateau farther north. Another chain seems to stretch in a northeasterly direction from Back River to the source of Hayes River. West of Back River Silurian strata prevail. The granite hills form a favorite haunt for the musk ox and reindeer.

Melville Peninsula consists chiefly of a chain of granite hills, sloping down to a Silurian plain in the eastern part of the peninsula. The northeastern part of Baffin Land is formed by a high chain of mountains stretching from Lancaster Sound to Cape Mercy. Long fjords and deep valleys divide them into many groups. Bylot Island, which stands high out of the sea, is separated from the mainland by Pond Bay and Eclipse Sound. The next group stretches from Pond Bay to the fjord of Anaulereë'ling. Farther to the southeast the groups are smaller, and in Home Bay they are separated by wide valleys, particularly near Eχalualuin, a large fjord on the southern side of that bay.

From this fjord an enormous highland, which I named Penny Highland, extends as far as Cumberland Sound, being terminated by the narrow valley of Pangnirtung. The eastern boundary runs through the fjords Maktartudjennaq and Narpaing to Nedluqseaq and Nudlung. In the interior it may extend to about fifteen miles east of Issortuqdjuaq, the most northern fjord of Cumberland Sound. The whole of the vast highland is covered by an ice cap sending forth numerous glaciers in every direction. In Pangnirtung and on Davis Strait they reach the level of the sea.

Penny Highland, which forms the main body of Cumberland Peninsula, has attached to it a few mountain groups of moderate extent: the peninsula of Nudlung and the highland of Eχalualuin and that of Qivitung.

Farther southeast, between the valleys of Pangnirtung and King-

nait-Padli, is situated the highland of Kingnait, with sharp peaks emerging from the ice cap which covers the lower parts of the plateau. The rest of Cumberland Peninsula is formed by the highland of Saumia, which much resembles that of Kingnait. Near Cape Mercy the ice covered highland slopes down to a hilly region, which falls abruptly to the sea.

The southern parts of this range of mountains are composed of gneiss and granite. It may be that Silurian strata occur in some places, but they have not yet been found anywhere in situ. The northern parts are too imperfectly known to enable us to form an idea of their geological character.

The mountains just described slope down to a hilly region, which farther to the west levels off to a plain. The hills are composed of granite, the plains of Silurian limestone, which extends from Prince Regent Inlet to the head of Frobisher Bay.

The peninsula between Cumberland Sound and Frobisher Bay is formed by a plateau, which slopes down gradually to the northwest. It is drained by a great river flowing into Auqardneling, a fjord on the western shore of Cumberland Sound. Near Lake Nettilling the country is very low, the level of the lake being only forty feet above that of the sea. Here the watershed between Cumberland Sound and Fox Basin closely approaches the eastern shore, coming within five miles of the head of Nettilling Fjord. It is formed by a narrow neck of land about a quarter of a mile wide and sixty-five feet above the level of the sea.

From Eskimo reports I conclude that the plateau of Nugumiut, as we may call the peninsula between Frobisher Bay and Cumberland Sound, is comparatively level. Only a single mountain south of Qasigidjen (Bear Sound) rises into the region of eternal snow.

The peninsula between Frobisher Bay and Hudson Strait is formed by a granite highland, the Meta Incognita of Queen Elizabeth. It is covered with ice and sends a few glaciers into the sea. Farther west, near Lesseps Bay and White Bear Sound, the country becomes lower. The narrow isthmus leading from Hudson Strait to Amaqdjuaq cannot be very high, as the Eskimo carry their kayaks to the lake, which I believe is about two hundred feet above the level of the sea.

Last of all I have to mention the highlands of King Cape. The rest of the land is taken up by a vast plain in which two large lakes are situated; the southern, Amaqdjuaq, empties by a short river into Lake Nettilling, whence the long and wide Koukdjuaq runs to the shallow sea. From observations made by Captain Spicer, of Groton, Conn., and information obtained from the Eskimo, we learn that the whole of the eastern part of Fox Basin is extremely shallow and that there are many low islands scattered about in those parts of the sea. The plains of Baffin Land, Fox Basin, and the eastern half of Mel-

ville Peninsula may be considered a wide basin of Silurian strata bordered by granitic elevations on every side.

Besides the configuration of the land, the extent of the land ice formed during the winter is of vital importance to the inhabitants of the Arctic region, because during the greater part of the year it affords the only means of communication between the tribes, and because in winter the seal, which constitutes the principal food of the Eskimo, takes to those parts of the coast where extensive floes are formed. Therefore the state of the ice regulates the distribution of the natives during the greater part of the year and must be considered in studying the habits of the Eskimo. The extent of the land ice principally depends on the configuration of the land and the strength of the currents. On a shore exposed to a strong current an extensive floe can only be formed where projecting points of land form deep bays. We find the distribution of ice regulated in accordance with this fact all around the shores of the Arctic Ocean.

The strong current setting out of Lancaster Sound and Smith Sound generally prevents ice from forming under the steep cliffs of the land. Sometimes the pack ice of the sounds is stopped and freezes together into rough floes; a smooth plain is never formed. By far the largest land floe is formed from Bylot Island to Cape Dyer (Okan). In Home Bay it extends to a distance of about eighty miles from the mainland. The formation of this floe is favored by a number of shoals which extend from the peninsulas of Cape Eglinton (Aqojang), Cape Aston (Niaqonaujang), and Qivitung, for the large floes drifting south are stopped by the icebergs aground on these banks. The greater part of the floe is very rough, smooth ice prevailing only in the bays.

The strong southerly current passing through the narrowest part of Davis Strait between Cape Walsingham (Idjuk) and Holsteinborg breaks up the ice all along the shore from Cape Dyer to Cape Walsingham, Exeter Sound alone being covered by a larger floe. The bay between Cape Mickleham (Nuvuktirpang) and Cape Mercy is well covered with ice, which extends to the islands farthest out toward the sea.

Near Cape Mercy the strong tides caused by Cumberland Sound prevent the ice from consolidating in the entrance of the gulf. As the sound widens greatly behind the narrow passage formed by Nuvukdjuaq and Qaχodluin, the tide sets in with great force. For this reason the floe never extends beyond that narrow entrance. Often the head of the open water runs from Qeqerten to Nuvujen, and instances are known where it even reaches the line of Pujetung-Umanaq.

The southwestern shore of Cumberland Sound from Qaχodluin to Cape Brevoort (Qeqertuqdjuaq) is always washed by water, because

a strong current, which often breaks up the ice of Field and Grinnell Bay (the bays of Ukadliq and Nugumiut), sets along the coast.

The floe seldom extends to Lady Franklin and Monumental Islands (Kitigtung and Taχolidjuin), but usually runs from point to point, compelling the natives to pass across the land in order to reach the floe of the neighboring bay. Most of the time the edge of the floe covering Frobisher Bay extends to a line from Countess of Warwick Sound (Tuarpukdjuaq) to about fifteen miles southeast of Gabriel Island (Qeqertuqdjuaq), whence it runs south to Kingnait. Sometimes Aqbirsiarbing (Cape True) is the most eastern point inclosed by the ice. A dangerous current sets through the strait between Resolution Island (Tudjaqdjuaq) and the mainland, forming whirlpools which menace every ship that attempts the passage.

Hudson Strait never freezes over. The greater part of the year it is filled with an immense pack which never consolidates into a continuous floe. As there are no large bays along the northern shore of that strait, no land floes of great importance are formed. Only the Bay of Qaumauang, North Bay, and Behm Bay (the bay of Quaiirnang and that east of Akuliaq) are covered with floes which are of importance to the natives. The bays east of Akuliaq and the large fjords of that region form a comparatively large body of ice.

Probably no land ice is formed between King Cape (Nuvukdjuaq) and the northern parts of Fox Basin. According to Parry and the reports of the natives, Fury and Hecla Strait and the bay which forms its eastern outlet are covered by land ice which is connected with the floe of the bays of Fox Basin as far as Piling.

In Hudson Bay there are very few places in which the land ice extends to a considerable distance from the shore. Neither Frozen Strait nor Rowe's Welcome freezes over, each being kept open by the swiftly running tides. The most extensive floes are formed in Repulse Bay, Wager Bay, and Chesterfield Inlet.

The drifting ice of the Gulf of Boothia never consolidates and even Committee Bay is rarely covered by a smooth land floe. Pelly Bay and the sea on the east coast of Boothia as far as Victoria Harbor (Tikeraqdjuq) freeze over, since they are sheltered by numerous islands. Still larger is the sheet of ice which covers the bay formed by the estuary of Back River, King William Land, and Boothia. The western shore of this peninsula farther north is skirted by a border of land ice the extent of which is unknown.

It is a remarkable fact that, although the extreme western and eastern parts of the country abound with extensive floes, the Hudson Bay region and the Gulf of Boothia are almost devoid of them.

This brief sketch will enable one to understand the geographical distribution and the migrations of the Eskimo tribes who inhabit this country.

DISTRIBUTION OF THE TRIBES.

GENERAL OBSERVATIONS.

The mode of life of all the Eskimo tribes of Northeastern America is very uniform; therefore it is desirable to make a few general observations on the subject before entering into a detailed description of each tribe. All depends upon the distribution of food at the different seasons. The migrations or the accessibility of the game compel the natives to move their habitations from time to time, and hence the distribution of the villages depends, to a great extent, upon that of the animals which supply them with food.

As the inhospitable country does not produce vegetation to an extent sufficient to sustain life in its human inhabitants, they are forced to depend entirely upon animal food. In Arctic America the abundance of seals found in all parts of the sea enables man to withstand the inclemency of the climate and the sterility of the soil. The skins of seals furnish the material for summer garments and for the tent; their flesh is almost the only food, and their blubber the indispensable fuel during the long dark winter. Scarcely less important is the deer, of whose heavy skin the winter garments are made, and these enable the Eskimo to brave the storms and the cold of winter.

That the mode of life of the Eskimo depends wholly on the distribution of these animals will therefore be apparent, for, as already observed, they regulate their dwelling places in accordance with the migrations of the latter from place to place in search of food.

When the constraint of winter is broken the natives leave their old habitations. The warm rays of the sun melt the roofs of their snow houses, the strong vaults which afforded shelter and comfortable warmth during the long cold winter begin to break down, and new houses must be built. They therefore exchange the solid snow houses for light tents, which are very small and poor, until a sufficient number of sealskins for better structures is secured.

As at this time seals are found in abundance everywhere, basking in the warm sunshine and enjoying the beginning of the spring, a great supply is easily secured. As the season advances food becomes more plentiful, and with the breaking up of the rivers and ponds the salmon leave the latter and descend to the sea. About this time the Eskimo establish their settlements at the head of the fjords, where salmon are easily caught in the shallow rivers. In July the snow, which has covered the land for nine months, has melted away and the natives undertake hunting trips inland, in order to obtain the precious skins of the reindeer and the meat of the fawns, which is always highly prized. With the breaking up of the ice the variety

of food is further increased by the arrival of the walrus and the ground and harp seals, which leave the country during the winter. Birds are also found in abundance, and no cares afflict the natives.

Before the sea begins to freeze over again the Eskimo return from deer hunting and gather at places where there are the best chances for obtaining food in the autumn. A few weeks are spent in making short excursions near the settlements, as longer journeys would be too dangerous during this tempestuous season. The colder it grows the more the natives are confined to their huts and the more they become dependent on the seal. While in summer shrubs of various kinds are available for cooking purposes, in winter blubber affords the only fuel for cooking and for heating their huts.

At last the smaller bays are sufficiently frozen to permit a new way of pursuing the game. The hunters visit the edge of the newly formed floe in order to shoot the seals, which are secured by the harpoon.

The process of freezing goes on quickly and the floating pieces of ice begin to consolidate. Only a few holes are now found, in places where icebergs, moved by the tides or the strong currents, prevent the sea from freezing. During a short time these openings form the favorite hunting ground of the natives. Though the walrus and the ground seal migrate to the edge of the floe as soon as the ice begins to form, the common seal (*Pagomys fœtidus*) remains, and this is always the principal food of the natives. In the autumn the fjords and the narrow channels between the islands are its favorite haunt; later in the season it resorts to the sea, frequently appearing at the surface through breathing holes, which it scratches in the ice. As winter comes on it is hunted by the Eskimo at these holes.

The foregoing observations will serve as a preliminary to the description of the distribution of the tribes of Northeastern America. The object of this section is to treat of the immediate relations between the country and its inhabitants, and a detailed account of their habits will be found in subsequent pages.

According to Dr. H. Rink, the Inuit race may be divided into five groups: the Greenlanders; the central tribes of Smith Sound, Baffin Land, the west shore of Hudson Bay, the Back River region, and Boothia; the Labradorians, on the shores of that peninsula; the Mackenzie tribes of the central parts of the north shore of America; and the tribes of Alaska. I am somewhat in doubt whether the central tribes and those of Labrador differ enough to justify a separate classification, as the natives of both shores of Hudson Strait seem to be closely related. A decisive answer on the division of these tribes may be postponed until the publication of Lucien M. Turner's excellent observations and collections, which were made at Fort Chimo.

BAFFIN LAND.

The Sikosuilarmiut.—I shall begin with the enumeration of the tribes in the southwestern part of Baffin Land. This country is inhabited by the Sikosuilarmiut, i. e., the inhabitants of the shore without an ice floe. They are settled in two places: Nurata, east of King Cape, and Sikosuilaq, within the peninsula (or island?) which projects east of King Cape. The large fjords Sarbaq and Sarbausirn, which belong to their territory, are known to me only by a description which I received in Cumberland Sound. In summer they visit the upper parts of this long fjord to hunt deer on the plains which reach to the shore of Fox Basin. Probably they do not extend their migrations very far to the north or northeast; otherwise, they would reach Lakes Amaqdjuaq and Nettilling, the region about the latter being the hunting ground of the natives of Cumberland Sound.

I know of only a single meeting between the Eskimo visiting Lake Nettilling and others who are supposed to have come from Hudson Strait. It occurred in 1883 south of the lake.

The Akuliarmiut.—This tribe is settled on the northern shore of Hudson Strait. Their winter resort lies west of Qeqertuqdjuaq (Parry's North Bluff). In summer they travel through White Bear Sound or Lesseps Bay to Lake Amaqdjuaq, which they reach after crossing a neck of land about ten miles in width. The exact direction of the road cannot be ascertained, as the position of their starting point, which is called Tuniqten, is doubtful. Crossing a short portage they ascend to Lake Amitoq, whence on a second portage they pass the watershed between Lake Amaqdjuaq and Hudson Strait. From the small Lake Mingong a brook runs into Sioreling and thence into Lake Amaqdjuaq (Baffin-Land, p. 67). On the southern shore of the large lake they erect their summer tents. Farther east, in North Bay, there is another winter residence of the same tribe. Unfortunately, I cannot specify the place of this settlement, which is called Quaiirnang.

The Qaumauangmiut.—East of the Akuliarmiut live the Eskimo so frequently met near Middle Savage Islands. Their principal residence is near Lake Qaumauang, from which they take their name Qaumauangmiut. My investigations concerning these tribes were much embarrassed by the want of trustworthy charts. If charts are tolerably well delineated, the Eskimo understand the meaning of every point and island and can give detailed accounts of the situation of the settlements and the migrations of the inhabitants.

Between Sikosuilaq and Akuliaq but a moderate amount of intercourse is kept up, as the settlements are separated by a wide and uninhabited stretch of land. Notwithstanding this many members of one tribe are found to have settled among the other. An Ameri-

can whaling station which was established in Akuliaq a few years ago may have had some influence upon the distribution and the life of these tribes. The greater importance of Akuliaq, however, cannot be ascribed to the presence of the whalers alone, as a few harbors near Sikosuilaq are also frequently visited by them. The whalers report that there are about fifty inhabitants in Sikosuilaq, about two hundred in Akuliaq, and farther east fifty more. Thus the population of the north shore of Hudson Strait probably amounts to three hundred in all.

The Qaumauangmiut are probably closely related to the Nugumiut of Frobisher Bay.

The Nugumiut.—I can give a somewhat more detailed description of this tribe, among the families of which Hall passed the winters of 1860–'61 and 1861–'62 (Hall I). Unfortunately, he does not give any coherent account of their life, only meager information being furnished in the record of his journeys. Besides, generalizations cannot be made from his two years' experience. My own observations in Cumberland Sound may serve as a complement to those of Hall. As he gives only a few native names of places, it is sometimes difficult to ascertain the exact position of the localities to which he alludes.

According to Hall and my own inquiries four places are inhabited by this tribe almost every winter: Tornait (Jones Cape of Hall), about thirty-five miles above Bear Sound, in Frobisher Bay; Operdniving and Tuarpukdjuaq, in Countess of Warwick Sound; Nugumiut, in (Cyrus W.) Field Bay; and Ukadliq, in (Cornell) Grinnell Bay. As these bays open into Davis Strait the formation of the ice is retarded and its extent diminished, and consequently some peculiarities in the arrangement of the life of the Eskimo are observed here. The only occupation of the Nugumiut and the inhabitants of Ukadliq is sealing with the harpoon on the floe of the inner parts of the bay. Near Ukadliq the tide holes east and west of Allen Island abound with seals. In winter, when the seals take to the open ice, the village of this group of families is established near Roger's Island, where the floe of the bay forms the hunting ground of the natives.

During the autumn the Nugumiut stay in Field Bay. The women are then busy preparing the deerskins; for, on account of the requirements of their religion, the walrus hunt cannot be begun until the deerskins which were taken in summer have been worked up for use. As soon as this is done they travel across Bayard Taylor Pass (so called by Hall) to Frobisher Bay, and in the latter half of December or in the beginning of January settle on Operdniving or on Tuarpukdjuaq in company with the natives who stay here during the fall. In Cumberland Sound I learned that this changing of the habitations takes place almost regularly and that sometimes the settlement is moved to Aqbirsiarbing (Cape True) if the bay is frozen

over beyond Operdniving. In traveling to Aqbirsiarbing the tide holes of Ikerassaqdjuaq (Lupton Channel) are avoided by using the pass of Chappell Inlet. Here and in Tornait the natives go sealing on the ice or walrusing at the edge of the floe, which in most cases is not very far off.

About the latter half of March part of the Eskimo begin to travel up Frobisher Bay. In the middle of April, 1862, Hall found a settlement on Qeqertuqdjuaq (Gabriel Island), from which island the floe edge was visited and young seals were caught in the narrow channels between the numerous islands. Towards the end of the month a portion of the natives went farther to the northwest in pursuit of the basking seals (I, p. 470), intending to reach the head of the bay in July. Hall found summer habitations at Ukadliq (I, p. 468); on Field Bay (p. 296); and on Frobisher Bay at Agdlinartung (p. 308), Opera Glass Point (p. 341), Waddell Bay (p. 341), and Nuvuktualung, on the southern point of Beecher Peninsula (p. 348).

A very important hunting ground of the inhabitants of Tiniqdjuarbiusirn (Frobisher Bay), of which I received some detailed accounts, is Lake Amaqdjuaq. In the foregoing remarks on the Akuliaq tribe I described the course which leads from Hudson Strait to the lake. Another route is followed in traveling from the head of Frobisher Bay to Lake Amaqdjuaq, a distance of about fifty miles. Probably the men leave Sylvia Grinnell River and ascend to Lake Amartung, from which lake a brook runs westward to Lake Amaqdjuaq (Baffin-Land, p. 68). The women take a different route and arrive at Aqbeniling after a tramp of six days, near a small bay called Metja. Here the summer huts are erected and birds and deer are killed in abundance.

The facility in reaching the lake from Hudson Strait and Frobisher Bay is a very important consideration, as the Akuliarmiut and the Nugumiut meet here, and thus an immediate intercourse between the tribes is opened. The inhabitants of Hudson Strait leave Tuniqten in spring, arrive at the head of Frobisher Bay in the fall, and after the formation of the ice reach the Nugumiut settlements by means of sledges. When Hall wintered in Field Bay a traveling party of Sikosuilarmiut which had accomplished the distance from King Cape in one year arrived there (I, p. 267).

Another route, which is practicable only for boats, connects Qaumauang with Nugumiut. It leads along the shore of Hudson Strait. The traveler sails through the dangerous passage between Tudjaqdjuaq (Resolution Island) and the mainland and crosses Frobisher Bay either at its entrance or in the shelter of the group of islands farther up the bay.

In their intercourse with the Nugumiut, the inhabitants of Cumberland Sound generally follow the long coast between Ukadliq and Naujateling, passing through the numerous sounds formed by long,

narrow islands. I can describe this region from personal observations.

The Oqomiut.—The Eskimo of Davis Strait call the tribes of Cumberland Sound and Saumia by the name of Oqomiut. The whole of the land from Prince Regent Inlet to the plateau of Nugumiut is divided by the Eskimo into three parts, Aggo, Akudnirn, and Oqo—i. e., the weather side, the center, and the lee side—and accordingly the tribes are called the Aggomiut, Akudnirmiut, and Oqomiut.

Unquestionably the whole of Cumberland Sound and the coast of Davis Strait from Cape Mercy to Exeter Sound belong to the Oqo of the Northern Eskimo. Farther north, the inhabitants of Padli extend their migrations from Qarmaqdjuin to Qivitung. These people occupy an intermediate position between the Akudnirmiut and the Oqomiut, having easy communication with both, and consequently it is doubtful to which they belong, so that the determination of the boundary between Oqo and Akudnirn remains arbitrary. In regard to their customs and from the position of the land, however, they may be more properly joined to the Akudnirmiut, of whom they would form a subdivision.

The names Oqo, Akudnirn, and Aggo must not be understood as respectively meaning a region strictly limited: they denote rather directions and the intervals between the localities situated in these directions. In asking for the position of Oqo one would be directed southeast, as this is considered the lee side; in the same way, if asking for Aggo, one would be directed to the shore of Prince Regent Inlet, the farthest land in the northwest, the weather side. In Cumberland Sound the natives of Iglulik are considered Aggomiut, while in Pond Bay they are known as a separate tribe. In the southern parts the whole of the northern region is comprised in the name Aggo; in the north Oqo means the whole of the southeastern regions.

Formerly, the Oqomiut were divided into four subtribes: the Talirpingmiut, on the west shore of Cumberland Sound; the Qinguamiut, at the head of it; the Kingnaitmiut, on the east shore; and the Saumingmiut, on the southeastern slope of the highland of Saumia. The names are derived from the districts which they inhabit, respectively. As the head of every fjord is called "qingua" (its head), the upper part of the large Cumberland Sound is also so named. The Qingua region may be limited by Imigen on the western shore and Ussualung on the eastern shore, though the name is applied to a region farther north; indeed, the name covers the whole district at the head of the sound. In looking from the head to the entrance of the sound the coasts are called according to their position: the southwestern Talirpia, i. e., its right one, and the northeastern Saumia, i. e., its left one; between Saumia and Qingua the highland King-

nait, i. e., the higher land as compared to the opposite shore, is situated.

Although at the present time this division is hardly justifiable, the names of these four tribes are often mentioned on the shore of Davis Strait. Their old settlements are still inhabited, but their separate tribal identity is gone, a fact which is due as well to the diminution in their numbers as to the influence of the whalers visiting them.

In my opinion a great difference between these tribes never existed. Undoubtedly they were groups of families confined to a certain district and connected by a common life. Such a community could more easily develop as long as the number of individuals was a large one. When the whalers first wintered in Cumberland Sound the population may have amounted to about 1,500. In 1840, when Penny discovered the sound, he met 40 Eskimo in Anarnitung (Eenoolooapik, p. 91). The greater number of the inhabitants were at the head of the fjords fishing for salmon, others were whaling in Issortuqdjuaq, and some were inland on a deer hunting expedition. The whole number at that time probably amounted to 200. A few years later the Kingnaitmiut of Qeqerten were able to man eighteen whaleboats. Assuming five oarsmen and one harpooner to each boat, the steersman being furnished by the whalers, and for each man one wife and two children, we have in all about 400 individuals. The inhabitants of Nettilling Fjord may have numbered as many, and 100 are said to have lived in Imigen. Penny found in Ugjuktung about 30 individuals who belonged to the Saumingmiut and had come thither from Davis Strait. Accordingly I estimate the whole tribe at 150 individuals. On the southwestern coast of the sound between Nuvujen and Naujateling a large number of natives were reported. They lived in three settlements and numbered about 600. These estimates are not absolutely reliable, as they are compiled largely from hearsay and conjecture. Many of the natives being away in the summer, at the time when these estimates were made, accuracy in their preparation was impossible. From inquiries which were made among American whalers who had visited this sound since 1851, the population of Qeqerten must have been larger than that of any of the settlements contiguous to the sound. The estimation is the more difficult as a few settlements were sometimes deserted; for instance, Ukiadliving, in Saumia, and Qarmaqdjuin (Exeter Bay). Probably eight settlements, with a population of 200 inhabitants each — i. e., 1,600 in the sound — would be about the true number in 1840. At first I was inclined to believe in the existence of a larger number, but from later reports I should consider this number too large rather than too small. Since that time the population has diminished at a terrible rate. In 1857 Warmow, a Moravian missionary who accompanied Penny, estimated it at 300. If this was correct, the rapid diminution must have occurred during the first years after the rediscovery of the

sound. In December, 1883, the Talirpingmiut numbered 86 individuals, the Qinguamiut 60, the Kingnaitmiut 82, the Saumingmiut 17; total, 245. These were distributed in eight settlements. Beginning with the most southern settlement, the Talirpingmiut lived in Umanaqtuaq, Idjorituaqtuin, Nuvujen, and Qarussuit; the Qinguamiut, in Imigen and Anarnitung; the Kingnaitmiut, in Qeqerten; the Saumingmiut, in Ukiadliving. Accordingly the population of the settlements numbered as follows:

Name of the settlement.	Married.		Unmarried.						Total.
	Men.	Women.	Widowers.	Widows.	Men.	Women.	Boys.	Girls.	
Naujateling	6	6	1			1	3	3	20
Idjorituaqtuin	3	3		1	1		2	1	11
Nuvujen	8	8	1	2	1		4	2	26
Qarussuit	10	10		2			2	5	29
Imigen	6	6					4	1	17
Anarnitung	12	12	1	1	1		8	8	43
Qeqerten	26	26		6	4		9	11	82
Ukiadliving	6	6		1		1	2	1	17
Padli	11	13	2	2	1		7	7	43
Akudnirn	8	12			2		(?8)		19
Total	96	102	5	15	10	2	(98)		328

I have included in the foregoing table the inhabitants of Davis Strait and may add that the Nugumiut number about 80, the Eskimo of Pond Bay about 50 (?), those of Admiralty Inlet 200, and of Iglulik about 150. The total number of inhabitants of Baffin Land thus ranges between 1,000 and 1,100.

The reason for the rapid diminution in the population of this country is undoubtedly to be found in the diseases which have been taken thither by the whalers. Of all these, syphilis has made the greatest ravages among the natives. Of other diseases I am unable to give a full account and can only refer to those which came under my observation during the year that I passed in this region. In Qeqerten a man died of cancer of the rectum, two women of pneumonia, and five children of diphtheria, this disease being first brought into the country in 1883. In Anarnitung I knew of the death of two women and one child. On the west shore a number of children died of diphtheria, while the health of the adults was good. In the year 1883–'84 I heard of two births, one occurring in Qeqerten, the other in Padli. At Qarussuit and Anarnitung there were two abortions.

The opinion that the Eskimo are dying out on account of an insufficient supply of food is erroneous, for, even though the natives slaughter the seals without discrimination or forethought, they do

not kill enough to cause any considerable diminution in numbers. The whalers do not hunt the seal to any extent, and when one realizes how small the population of the country is and how vast the territory in which the seal lives it is easy to understand that famine or want cannot arise, as a rule, from the cutting off of the natural food supply. In fact, in the spring enormous numbers of seals may be seen together basking in the sun or swimming in the water.

The causes of the famines which occur somewhat frequently among the Eskimo must be sought in another direction. Pressing need often prevails if in the latter part of the autumn the formation of the floe is retarded; for in that case hunters are not able either to go hunting in boats or to procure the necessary food at the edge of the floe, as new ice is attached to its more solid parts and the seals do not yet open their breathing holes. Such was the case at Niaqonaujang, on Davis Strait, in the fall of 1883. Gales of wind following in quick succession broke the floe. The new ice which had formed immediately prevented the natives from sealing, and in November and December a famine visited the settlement. Very soon the supply of blubber was exhausted, and being unable to feed the dogs the inhabitants were obliged to kill them one after another and to live upon their frozen carcasses. Only two dogs survived these months of need and starvation. Consequently the hunting season was a very poor one, since the natives missed the services of their dogs, which scent the breathing holes, and could not leave their settlement for any great distance.

In winter a long spell of bad weather occasions privation, since the hunters are then prevented from leaving the huts. If by chance some one should happen to die during this time, famine is inevitable, for a strict law forbids the performance of any kind of work during the days of mourning. When this time is over, however, or at the beginning of good weather, an ample supply is quickly secured. I do not know of any cases of famine arising from the absolute want of game, but only from the impossibility of reaching it.

Sometimes traveling parties that are not acquainted with the nature of the country which they visit are in want of food. For instance, a large company, consisting of three boat crews, were starved on the eastern shore of Fox Basin, their boats being crushed by the heavy ice and the game they expected to find in abundance having left the region altogether. On one of the numerous islands of Nettilling a number of women and children perished, as the men, who had been deer hunting, were unable to find their way back to the place in which they had erected their huts.

Another case of starvation is frequently mentioned by the Eskimo. Some families who were traveling from Akuliaq to Nugumiut passed the isthmus between Hudson Strait and Frobisher Bay. When, after a long and tedious journey, they had reached the sea, the men left

their families near Qairoliktung and descended with their kayaks to Nugumiut in order to borrow some boats in which they could bring their families to the settlements. On the way they were detained by stormy weather, and meanwhile the families were starved and resorted to cannibalism. One woman especially, by the name of Megaujang, who ate all her children, was always mentioned with horror.

Generally food is plentiful between the months of April and October and an ample supply may be secured without extraordinary exertion. During the winter sealing is more difficult, but sufficiently successful to prevent any want, except in the case of continuous bad weather.

I shall now proceed to a description of the single settlements of Cumberland Sound. Separated from the Nugumiut by a long and uninhabited stretch of land we find the settlement of Naujateling, the most southern one of the Talirpingmiut. In the fall the natives erect their huts on the mainland or on an island near it, as the seal, at this season, resort to the narrow channels and to the fjords. Besides, the shelter which is afforded by the islands against the frequent gales is an important consideration, and in these protected waters the natives can manage their frail boats, which would not live for a moment in the tempestuous open sea. Later in the season the ice consolidates in the shelter of the islands, while beyond the bays and channels drifting floes fill the sea.

After the consolidation of the pack ice the natives move their huts to the sea. They leave Naujateling about December and move to Umanaqtuaq. I do not know exactly where they live if the water reaches that island. Should this happen, the floe between Qaχodluin, Umanaqtuaq, and Idjorituaqtuin would offer a productive hunting ground.

About the middle of March the season for hunting the young seal opens. The hunt is prosecuted with much energy over the entire extent of Cumberland Sound, because the white coat of the young animal is of prime importance for the inner garments. The pregnant females take to the rough ice, where deep snowbanks have been formed by the winter gales, and dig large excavations, in which parturition takes place. Another favorite place is the ground ice on gradually declining shores, where large caves are found between the broken pieces of ice. Therefore the fjords and islands which offer a long coast line furnish a good hunting ground, and in the latter part of March and in April the Eskimo either visit these regions or the floes of rough ice. At such times they sometimes live for a long period on the ice of the open sea in order to be nearer to their hunting ground. As the success of the hunt depends on the extent of ice visited, the Eskimo scatter over a large area, almost every one traveling over a separate tract.

At this time the winter settlements are almost totally broken up.

Some of the natives of Naujateling go bear hunting instead of "young sealing," but only a few polar bears lose their way into Cumberland Sound. They are generally found within a few miles of the floe edge, and even if the water reaches pretty far up the sound they do not travel beyond Qaχodluin and Miliqdjuaq, nor does the pack ice carry them far up the sound in summer. On one occasion, in the year 1880, three bears were seen near Qeqerten, about five years earlier one was killed in Qingua, and almost twenty years earlier another one near Anarnitung. Every occurrence of this kind is considered an event of such importance that it is talked about for years afterwards. I myself saw bear tracks in Kouaqdjuaq in March, 1884, and also at Miliqdjuaq. In February a bear was killed between Kautaq and Naujateling.

If the water washes the foot of the cliffs between Kautaq and Sulung, the Eskimo cross the isthmus which lies between Ijelirtung, the eastern branch of Qasigidjen, and Qaχodluin Bay on a sledge road and hunt among the islands that are scattered along the shore south of Qaχodluin. In summer they visit the same region on their hunting excursions.

The principal summer settlements are at the head of Qasigidjen and Kangertlung Fjords, which are situated near Idjorituaqtuin and Qimissung.

From here they ascend the plateau of Nugumiut and hunt on the level highlands. I think it takes them but a day to travel to the top of the plateau. They travel from Qasigidjen to Agdlinartung, a fjord of Frobisher Bay, whence the Nugumiut ascend the highland. Another route leads from Kangertlung to Eχaluin, near the head of Frobisher Bay.

Farther up the sound we find the winter settlement of Idjorituaqtuin. The same relation exists between this place and Qimissung as between Umanaqtuaq and Naujateling. On Qimissung, which lies near the mainland, the natives gather in the fall after returning from deer hunting, and only move to Idjorituaqtuin after the freezing up of the sea. Deer are hunted inland, the summer settlements being at the head of one of the numerous fjords of the west shore. Favorite places are Kangertlung, which is also visited by the Naujateling Eskimo; Eχaluin, which can be reached from Kangertlung by a short overland road; Auqardneling; and Utiqimitung, at the entrance of Nettilling Fjord. A large river, which, according to Eskimo reports, runs through the greater part of the peninsula, empties into Auqardneling. As it is very deep and wide it cannot be crossed without a vessel of some character, and thus it puts a stop to the migrations from Kangertlung and Eχaluin. In traveling from Kangertlung to Frobisher Bay the river must be crossed. To accomplish this the natives fill a deerskin with shrubs, sew it up, and float themselves across. Only the road leading from Qasigidjen to Frobisher Bay avoids the river.

North of Idjorituaqtuin we find the winter settlement of Nuvujen with the fall settlement, Nuvujalung, a high cliff at the entrance of Nettilling Fjord, belonging to it.

By far the most interesting branch of the Talirpingmiut are the inhabitants of Nettilling Fjord. Among all the tribes of Baffin Land this one claims particular attention, as it is the only one whose residence is not limited to the seashore. From Greenland to the mouth of the Mackenzie only two Eskimo tribes are known who do not live all the year round on the coast of the sea. These are the Talirpingmiut and the Kinipetu of Chesterfield Inlet. Back and Anderson and Stewart say that the latter tribe spend a great part of the year at the lakes of Back River.

Formerly the Talirpingmiut had three or four settlements on Lake Nettilling: at Tikeraqdjung, near the south point of the lake; at the outlet of Koukdjuaq, on the left bank of the river, opposite to Nikosiving Island; at Qarmang; and probably a fourth one, on the north shore. As the lake abounds with seals, they could live here at all seasons. Its western part seems to have been particularly fitted for winter stations. In the winter of 1877–'78, three families staid near Koukdjuaq without encountering any considerable difficulty in procuring food. This was the last time that natives passed the winter at the lake; the greater portion of the tribe may have retreated to Nettilling Fjord about twenty years ago.

Though the Eskimo assert that the discovery of Lake Nettilling is of recent date, naming two men, Kadlu and Sagmu, as those who first reached it, this assertion is not trustworthy, for with them almost every historical tradition is supposed to have originated a comparatively short time ago. I was told, for instance, that an event which is the subject of the tale Igimarasugdjuqdjuaq the cannibal occurred at the beginning of this century, and yet the tradition is told almost word for word in Greenland and in Labrador.

Just so with Kadlu and Sagmu. According to the assertion of the natives the lake was discovered by the generation before the last—i. e., about 1810—and yet an old woman about seventy-five years of age told me that her grandfather when a young man, starting from Nettilling, had visited Iglulik and that he had lived on the lake. The customs and habits of the Eskimo would have led to the discovery of the lake very soon after the first visit to Cumberland Sound, and no doubt their attention was then called to the abundance of game in this region.

The greater part of the natives spent the winter in Nettilling Fjord, starting on their way inland about the beginning of May, and returning to the sea about December. I suppose that cases in which men spent their whole life on the lake were exceptional, for they are referred to by the natives as remarkable events. For instance, a man called Neqsiang, who had two wives, lived on a small island near

Koukdjuaq and never descended to Cumberland Sound. A few times only he is said to have sent his son to barter with the Talirpingmiut of Nettilling Fjord. He came to Qarussuit in the spring, but returned after a short stay. It may be remarked here that the total absence of salt does not prevent the natives from staying on Lake Nettilling.

About 1850 the mode of life of the Talirpingmiut was as follows: In November they gathered in Isoa, the easternmost bay of the lake, descended toward the sea, and lived during the following months at the entrance of Nettilling Fjord. There they lived in the same manner as the other Oqomiut, pursuing the seals at their breathing holes. In the spring they hunted young seals; but, when the other natives began to prepare for whaling, they traveled on sledges westward. They avoided the large tide holes of the long fjord by making use of a few passes. Although the fjord is impassable in spring, a safe road leads along its northern shore to its northern branch, Kangertlukdjuaq, where the water hole Sarbaqdualung may be avoided by crossing the land at Tunukutang. In the spring large water holes are formed near Neqemiarbing and at the entrance of Audnerbing, compelling travelers to pass over the island which separates the two passages of Sarbaqdualung. The pass Tunukutang, which is used in winter, consists of a steep and narrow neck of land, which separates a small lake from Kangertlukdjuaq, and a short and winding river, the outlet of the lake. The second tide hole of the fjord may be passed by the branches Qasigidjen and Sarbaqdjukulu and the adjoining flat isthmus. The holes of Qognung, yet farther up the fjord, do not hinder the natives, as they do not occupy the whole width of the floe.

At length they reached Kangia, and from here a chain of small lakes was ascended, the watershed Ujaraqdjuin was crossed, and finally they arrived at Amitoq. Cairns are everywhere erected on prominent points for way marks. After they had come to Lake Nettilling, they rested a short time at Isoa, where the skin boats and the necessary household goods had been left the preceding fall. These were lashed upon the sledges and then they traveled as quickly as possible to the west. After following the southeastern shore to Tikeraqdjuaq they crossed the lake to a point near Tikeraqdjung, whence they went along the southern shore of the lake, reaching Koukdjuaq in about a fortnight. Here their tents were established on the left bank of the river, opposite to Nikosiving, where they staid until the breaking up of the ice. Then the men descended the river in their kayaks. Four days they followed the coast, passing the bay of Aggirtijung before they reached Qudjitariaq, a long and deep river, which they ascended. For a few weeks they hunted deer among the lakes of this region, which is called Majoraridjen, and then slowly turned southward. At last, about the latter half of Au-

gust, they reached Qarmang, where at the beginning of summer the women and old men had arrived in their large boats. Here the whole party stopped until the lake was frozen up. Then they returned on sledges to Isoa and to the sea.

It would be very interesting to learn how far the natives formerly extended their migrations along the shore of Fox Basin and whether a regular intercourse existed between Iglulik and Cumberland Sound. According to reports of some old Eskimo, who had themselves passed the winter on the lake, there was always a small settlement at Qarmang. From here the shore of Fox Basin was reached with great ease. If, however, the route through Koukdjuaq had to be taken, a long, roundabout way was necessary. According to all reports, even in olden times expeditions to Iglulik were very rare. It is said that one was made about 1750 by a party under the leadership of an Eskimo, Makulu. About 1800 another party left, in which Kotuko assumed the leadership. About these a more detailed account exists. With a few boats and four kayaks they left Nettilling and followed the coast. Alone in his kayak, Kotuko visited Sagdlirn, an island east of Iglulik, but he did not see any people, as they were on a hunting excursion. He found one hut and a large dog. There were a great number of deerskins and walrus tusks, which proved the existence of an abundance of game. He returned, but on account of the prevailing fog could scarcely find his kayak. The absence of the party is said to have lasted three years.

About 1820 another party left for Iglulik, among whom two women, Amaroq and Sigjeriaq, were the most prominent. When they returned, after an absence of three years, they praised the country (Piling), where they had spent some time, as a land of plenty and abundance, and by these tales, in 1835, induced three boat crews to leave Nettilling in order to visit this happy land. They were grievously disappointed and after many misfortunes they perished on the narrow isthmus of Ipiuting. Their bodies were found by the Iglulik Eskimo, who related that the poor fellows had resorted to cannibalism. Among those who perished was a sister of the famous Hannah (Taqulitu), the companion of Hall in his travels in the Arctic. I must mention here that Hall, in 1868, met a native at Iglulik who was said to belong to Cumberland Sound. As, however, in Iglulik Cumberland Sound and Davis Strait are often confounded, I am inclined to think he was a native of the latter region.

From these facts it appears that a regular intercourse between the tribes along the shore of Fox Basin never existed, though formerly interviews were more frequent than they are at present. Since the last mentioned expedition no Eskimo has visited Piling, nor have any gone by the way of Lake Nettilling to Iglulik. Accordingly the ideas of the Oqomiut about that region are very indefinite. An old man

was the only person whom I could find who knew Iglulik by name and remembered Ingnirn and Piling, two places which had been inhabited by many Eskimo. He mentioned another inhabited region beyond Iglulik, Augpalugtijung, which I was not able to identify. It was described as a large peninsula.

It is worth remarking that the Talirpingmiut seem never to have traveled over the country south of Koukdjuaq. I have not even heard mentioned a single hunting excursion made in this direction.

In the foregoing paragraphs I have described the mode of life of the greater part of the Talirpingmiut. Still another part staid in Cumberland Sound until the ice had gone and went away in the latter half of July. The passage through the rapids of the fjords was very dangerous, as in the whirlpools and overfalls the bulky boats were easily capsized. Therefore the changing of the tides had to be considered in order to effect a safe passage. The men preferred carrying the kayaks over the passes in order to avoid the dangers imminent to their frail crafts. Even up to this day tradition tells of a disaster which happened when the stubborn owner of a boat, against the warning of his friends, tried to pass Sarbaqdualung when the spring tide was running swiftly. The boat was upset and the crew were drowned, with the exception of one woman, who was saved on a bundle of deerskins.

From Kangia boats had to be carried over the portages Igpirto, Igpirtousirn, and Ujaraqdjuin. The rapids of Angmartung were also avoided by a portage over the level bottom of the valley. After passing Taquirbing, Lake Nettilling was reached, on the shore of which the huts were erected. In the fall the party returned before the beginning of the cold season. It has been already mentioned that only a few of the natives staid at the lake during the entire year, and even among these there were some who descended to the sea in March to take part in the young sealing, for the skins of the young seal cannot be altogether replaced by deerskins.

At the present time it is exceptional for any one to remain inland during the entire year. There may be seals enough in the lake to prevent hunger or starvation, but they are taken much more easily from the sea. In case of a lack of blubber, deer's marrow may be used for fuel. It is probable that the high mortality of recent years has induced the Eskimo to band together more closely than they formerly did and to adopt the plan of returning to Nettilling Fjord at the beginning of winter. In the fall the boats and other articles which are of no use in winter are left in Isoa, and some time is spent in Kangia, where snow houses are built. Here the kayaks are left, and in December, when the sealing begins to be more successful near the sound, the Eskimo turn to the entrance of Nettilling Fjord, where Tininiqdjuaq and Neqemiarbing are favorite places. Seals are hunted there with the harpoon in the same way as in the other settlements

or Sarbaqdualung is visited for the purpose of shooting seals which frequent the tide holes. This, however, is not a favorite way of hunting, as the ice near the tide holes is very rough and treacherous.

In March and April young seals are caught on the shores of the numerous islands between Tiniiqdjuaq and Nuvujalung, and at the same time the old settlements are left, as large water holes begin to appear. Qarussuit and Qingaseareang are the favorite places about this time of the year.

As soon as the young sealing is finished the hunt of the basking seal is opened, which is very successful here. Nowhere else did I see such large numbers of animals enjoying the warmth of the sun as in Nettilling Fjord. In April, when on the east shore scarcely any dared to leave the water, hundreds might be seen here. By the first of May all the natives have procured a sufficient number of sealskins for their summer dress, the skins being then in the best condition, as the first moulting has just occurred. This done, they eagerly prepare for the journey to the lake.

The natives start in the first week of May, and in two or three days arrive at Kangia, whence they reach Isoa in one day's journey. Following the southern shore of Lake Nettilling they sleep the first night on Tikeraqdjuausirn, the second on the island Manirigtung, near Tikeraqdjuaq, and five days after leaving Qarussuit arrive at Tikeraqdjung, where they settle for the summer. As numerous deer are found in this region, they live without any care or trouble. Very soon after their arrival the birds return. While moulting great quantities of these are caught. The geese are so abundant here that they are fed to the dogs. Many deer are caught while passing the deep river which runs from Lake Amaqdjuaq to Lake Nettilling. Frequently they visit the southern plains, which are filled with lakes and lakelets. Sometimes they go as far as Amaqdjuaq, which, as the older natives report, was formerly a summer settlement.

In the river whose outlet is near Padli salmon are caught in abundance. In this district the Talirpingmiut stay until the eastern part of the lake is frozen over.

In the shelter of the islands the floe is more quickly formed than in the open water of the western part, and in November the natives return by sledges to Isoa.

As they take with them heavy loads of deerskins they make very slow progress and generally arrive at their place of destination after six days of traveling. Sometimes they make a short trip to Isoa in March or April to hunt deer or to look for the things which were left behind in Kangia and Isoa at the time of their last departure.

Besides the Talirpingmiut quite a number of Cumberland Sound natives visit the lake by means of boats. They cross the sound after the breaking up of the ice and go to Nettilling, carrying the boats over the portages between Kangia and Isoa. As the Talirpingmiut

have no boats they stay at Tikeraqdjuaq; the other natives, however, sometimes change their habitations and even visit Qarmang and the north shore of the lake. These journeys, however, are rare, for in the eastern part an inexhaustible supply of food may be obtained; therefore long excursions are quite unnecessary. At the beginning of October the boats leave the lake and the natives return to the fall settlements in the sound.

Nettilling Fjord, with its numerous islands, forms the northern boundary of Talirpia. Farther north we come to Qingua, the head of Tiniqdjuarbing (Cumberland Sound). It extends from Imigen to Ussualung. The winter settlement on the island of Imigen is situated in the midst of one of the best winter hunting grounds, for the southern portion of the island, on which the huts are erected, projects far out into the sea. The hunt is often rendered somewhat difficult by the rough ice which is due to the strong currents between Pujetung, Imigen, and Nettilling Fjord. Towards spring the natives sometimes resort to a place yet nearer the open sea, the largest island of the Pujetung group. Young seals are caught near Imigen, at the Kilauting Islands, and in Qaggilortung. This district, however, cannot be visited every year, as almost every spring the whole area west of a line from Imigen to Anarnitung is covered with very deep and soft snow, which prevents the Eskimo from using their dog sledges. When this condition prevails the natives settle on the sea ice between Augpalugtung and Imigen, or a little farther north, and remain there from the middle of March until the latter part of April.

These natives go deer hunting either to Issortuqdjuaq—where they live at Eχaluaqdjuin, Sirmiling, or Midlurieling—or to Eχaluqdjuaq, near Ussualung, where they hunt in the hilly land adjoining the ice-covered Penny Plateau. As the land farther northwest is said to consist of irregular hills and disconnected valleys, the skins and the meat of the killed deer would have to be carried up and down hills before the settlement was reached. Therefore the natives dislike hunting in this part of the country.

Eχaluaqdjuin and Eχaluqdjuaq, as is denoted by the names, are productive salmon rivers. In starting from the former and ascending a narrow valley, Lake Eχoleaqdjuin is reached, whence a pass leads to the valley adjoining Eχaluaqdjuin. Taking another road the long Lake Imeraqdjuaq is reached, which borders upon the glaciers of the highland. From here, after a four days' tramp following a large river, the traveler comes to Midlurieling. From Issortuqdjuaq a narrow isthmus offering a good sledging road is used in visiting the head of Qaggilortung. Another route, which is suitable only for foot passengers, leads by a chain of lakes to the head of Kangertlukdjuaq. It is not necessary to enumerate the overland routes in this district, as numerous valleys permit the traveler to pass from the east to the west and from the south to the

north. In the fall the natives resort to Saunirtung or to Saunirtuqdjuaq, two islands northwest of Imigen, where they stay until January, when they return to the sea.

The second settlement of the Qinguamiut is Anarnitung, at the northern entrance of Qaggilortung. The small island and the neighboring point of Igdlungajung are, next to Qeqerten, the seat of the most important settlement of Cumberland Sound. On the southern and eastern declivity of the low hills which form this island are a number of very old stone foundations (see p. 549), such as are found everywhere on the Arctic shores of North America (Baffin-Land, p. 77).

If the ice in the upper parts of the sound is smooth, families belonging to this community settle on Kilauting, the largest island of a group running from northwest to southeast a few miles north of Imigen. Here they go sealing with the harpoon. If the ice, however, is rough (as it happened to be during my stay in Cumberland Sound), they remain in Anarnitung, whence some go to the water holes at the entrance of Issortuqdjuaq and shoot the blowing seals, while others go hunting on the ice near Anarnitung.

During the young sealing season they almost always leave the island. The favorite resort at this season is Sakiaqdjung, near Manituling, in Qaggilortung, but heavy snowfalls often compel them to exchange this region for the open sea. If they insist upon stopping there, snowshoes are used as the only means of traveling in the deep and soft snow. In 1878, when the Florence wintered in Anarnitung Harbor, the greater part of the natives remained near the ship; but her presence is accountable for this exception, as some of the families were in her service and others staid near her in order to barter seals, skins, &c.

Of some importance are the passes leading around the numerous water holes at the head of Cumberland Sound. The narrow island of Nudnirn, which separates Sarbuqdjuaq from Putukin, offers a good passage by way of a deep valley. Should the passage be made in a mild winter or in spring, when the water holes of Sarbuqdjuaq have enlarged, they must avoid the latter by passing over the inconvenient isthmus of Itidliaping, west of the steep cliff Naujan.

In spring the tide holes of Kangidliuta extend over the passage between that island and Surosirn, preventing sledges from passing to Issortuqdjuaq or to Tessiujang. Then Qaχodlualung is crossed by the way of Naqoreang or the more southerly Tappitariaq, which leads into the sound near Siegtung. Both passes are very inconvenient. From Tessiujang, Issortuqdjuaq may be reached by the fjords Ugjuktung and Itijareling and by the adjoining passes.

Lastly, I have to mention the road formerly used by the natives of Anarnitung in traveling to Nettilling. They crossed the entrance of Qaggilortung and ascended Tarrionitung, whence they came by the Lakes Qamusiojodlang and Irtiujang to Missirtung, in Nettilling

Fjord, thus avoiding a much longer journey around the large peninsula projecting to the eastward. A similar pass farther east connects Tornait and Kangertlukjuaq.

The ruins of a third settlement of the Qinguamiut are found at Tulukan on Qeqertelung.

The next subtribe to be treated is the Kingnaitmiut, who are now located exclusively upon Qeqerten. Formerly they lived in several places — for instance, near Pangnirtung and on Miliaqdjuin — but for a long time they have gathered on Qeqerten, as two whaling stations are established here, many natives being in the service of the whalers. The island is the largest settlement of the sound. It is a favorite resort during the fall and the first part of winter. In November and December, before the ice of the sound consolidates, the ice east of the islands is the best hunting ground. Later that west of the islands is preferred. There is one disadvantage peculiar to Qeqerten which is not shared by the other settlements, namely, the fohn-like winds which often blow for many days from Kingnait Fjord with irresistible violence. These confine the natives to their huts, though a few miles north or south calm weather prevails. Should fair weather ensue, the snow, which has been firmly packed by these gales, affords a good hunting ground; but if, on the other hand, long spells of bad weather follow, want and hunger may be the result. The young seals are eagerly pursued all about Qeqerten.

In Pangnirtung and in the little valley Niutang, in Kingnait, well up in these fjords, are the ruins of two large, ancient settlements. The conditions which formerly enabled the natives to live here will be mentioned later.

The Kingnaitmiut go deer hunting to Kitingujang, at the head of Kingnait Fjord; to Nirdlirn, in the bay behind Augpalugtung and Sednirun; to Pangnirtung; or to the more southern fjords Exaluaqdjuin and Kangertlukdjuaq.

I shall describe the districts occupied by the Kingnaitmiut, Saumingmiut, and Padlimiut together, as they all bear a uniform character.

From Nirdlirn the mountains of Ussualung or the highland near Ukiuqdjuaq are visited. The same country is traveled over from Pangnirtung, where the settlement is established either above Qordlubing or opposite Aulitiving. The deep valley, with its numerous glaciers, adjoining Pangnirtung and connecting Cumberland Sound and Davis Strait is rarely visited.

The favorite place for the settlement is Kitingujang in Kingnait. In the river which empties here many salmon are caught, and the declivities of the neighboring highlands, which are less steep than those of Pangnirtung, afford ample opportunity for long hunting excursions. Deer are found on the mountains, for here they escape

the mosquitoes which swarm in the valleys. The natives do not go beyond Padli, but most of them have been there. They often travel through the valleys of Nerseqdjuaq and Tunussung to Pangnirtung, of Davis Strait, down the eastern shore of which they go a considerable distance. Sometimes they make boat excursions during the summer from Kitingujang, visiting the brooks which empty into Kingnait Fjord, or they settle in Tornait, whence Tupirbikdjuin in Pangnirtung is accessible by the wide valleys surrounding Angiuqaq.

I may omit the description of the separate summer habitations farther south, for the head of every fjord and every valley that is a means of reaching the interior are used for erecting the tents. The interior of the region, which is covered with ice, remains unvisited, no game being found there. Therefore it may be said in general that the Eskimo are limited to the peninsulas formed by the numerous fjords.

The Saumingmiut visit the southern fjords of Cumberland Peninsula, where I have marked the settlements on the chart. Here they pursue deer and polar bears, which frequently come down to Cape Mercy during the summer.

An important summer settlement of the Saumingmiut is Touaqdjuaq, from which place they visit the peninsula limited by Exeter Sound and Touaqdjuaq. An important summer station of both Saumingmiut and Padlimiut is Qarmaqdjuin, while Eχaloaping (Durban Harbor of the whalers), near the entrance of Padli, is visited only by the latter tribe.

The number of deer on Cumberland Peninsula is so variable that the result of the hunt is often unsatisfactory. Although in some seasons numerous herds are met, in others scarcely enough animals are killed to afford a sufficient stock of skins for the winter clothing. Early in the spring the deer pass quite regularly through Itidlirn (the lower part of Padli Valley, between Ikaroling and Padli), in their migrations from Narpaing to Qarmaqdjuin. I was told that in both the latter districts many deer can be found at all times.

Lastly, I have to describe the winter settlements of the Saumingmiut. They are in the habit of separating in the fall, part of them staying during winter on Qeqertaujang, in Ugjuktung, and the remainder at Ukiadliving, on Davis Strait.

Strange as it may seem, walrus are not found in the upper part of the sound, while farther south they are abundant. Akuliaχating, east of Qeqerten, is the most northern point that they visit. It is said that in former times they were met with everywhere in the sound, and indeed some of the local names give evidence of the truth of these traditions; for instance, the name of Uglirn (which is always applied to walrus islands), in the fjord Qaggilortung, and that of Anarnitung (a place having a bad smell from walrus excrement), at the head of the sound.

Before Cumberland Sound begins to freeze up, the Eskimo of Ugjuktung take walrus on the islands Uglirn, south of Qeqertaujang, and at Qeqertaq in Anartuajuin. The animals killed during the fall are buried under stones, and with this stock of provisions the Saumingmiut do not suffer want during the winter. In addition, however, they go sealing at the entrance of Ugjuktung, or travel overland to Kangertloaping, a branch of Kouaqdjuaq, as Nuvukdjuaq is almost always washed by water and cannot be passed in winter. The young sealing is here of little importance, as the bears visit the fjords about this season and frighten the animals away. In March the natives go bear hunting or move up the sound to join the Kingnaitmiut during the time of young sealing. In the spring the settlement is always abandoned, as most of them go to Davis Strait and join the other part of the tribe. Crossing the country, they travel over a pass leading from Anartuajuin to Ujaradjiraaitjung.

The favorite settlement on the east coast is Ukiadliving. There are several stone foundations in this place which are frequently reconstructed and used as dwellings. Here walrus are hunted in the summer and in the fall and a great stock of provisions is laid up. In winter the floe offers a good hunting ground for sealing and in the spring the bears visit the land and the islands to pursue the pupping (i. e., pregnant or parturient) seals. At the same time the she bear brings forth her young, the meat and skin of which are highly prized. Many old bears and cubs are killed at this season and the precious skins are prepared for sale.

Besides the beforementioned route another and longer one leads to Cumberland Sound. In taking this course the sledges start from Nedluqseaq, west of Ukiadliving, and follow a river which rises in a small lake whence the inland ice is ascended. Farther on the valley leading to Eχaluaqdjuin and Kangertlukdjuaq is reached. This is the only overland route on which the inland ice is crossed. Cape Mercy can be passed by a number of short isthmuses. In the shelter of the bay formed by the cape and Muingmang a floe is formed reaching to the foot of Uibarun (Cape Mercy). The pass Tappitaridjen, which cuts off two peninsulas, leads into the sound. The bays farther west are frozen up and the projecting points are avoided by short passes. Unfortunately this road was unknown to me during my stay in Saumia, else I could have easily visited Cape Mercy. At last Anartuajuin is reached. The water rarely extends to Nuvukdjuaraqdjung, the point between Anartuajuin and Ugjuktung. It may be passed by a difficult road leading across the peninsula. If the water extends to Iliqimisarbing a pass is used which is ascended from Eχalualuin, in the bay of Naujaqdjuaq.

On Davis Strait a few important isthmuses must be mentioned. One is used by the inhabitants of Ukiadliving in traveling to Exeter Sound. They leave the sea at the head of Touaqdjuaq and by a

difficult overland route cross to the southern shore of Exeter Sound. Much of the time the ice and snow near Udlimaulitelling make the route almost impassable in that direction. If, therefore, this route is impracticable or that through Touaqdjuaq is too difficult on account of the absence of snow, the journey is postponed until late in spring, when the hummocks begin to be leveled off and the snow becomes harder as it settles; then the rough ice can be passed, and after reaching Ituatukan, a fjord near Cape Walsingham, the Eskimo ascend it, so as to avoid the cape, which is always washed by water. If snow and ice are in a suitable condition the passage by way of Ituatukan is always preferred.

From Exeter Sound Kangertlukdjuaq, in Padli Fjord, may be reached by a pass of short extent; but the snow is always so deep here that the passage cannot be effected until June. The peninsulas between Padli Fjord and Exeter Sound, which have no ice foot, can be crossed by narrow isthmuses near the head of the bays.

Before leaving Cumberland Sound and its inhabitants, the Oqomiut, altogether, I wish to add a few remarks on the whale fishery, which the Eskimo formerly carried on in their bulky skin boats. They pursued the monstrous animal in all waters with their imperfect weapons, for a single capture supplied them with food and fuel for a long time. I do not know with certainty whether the natives used to bring their boats to the floe edge in the spring in order to await the arrival of the whales, as the Scotch and American whalers do nowadays, or whether the animals were caught only in summer. On Davis Strait the Padlimiut and the Akudnirmiut used to erect their tents in June near the floe edge, whence they went whaling, sending the meat, blubber, and whalebone to the main settlement. In Cumberland Sound whales were caught in all the fjords, particularly in Kingnait, Issortuqdjuaq, and the narrow channels of the west shore. Therefore the Eskimo could live in the fjords during the winter, as the provisions laid up in the fall lasted until spring. If, therefore, there is a perceptible diminution in the supply of their food it is due to the fact that the whale fishery has been abandoned by them or rather has been yielded up to Europeans and Americans. It is not probable, however, that a sufficient number of whales were ever caught to support the entire population during the whole of the winter. The whaling is still kept up by the Eskimo of Hudson Strait and Hudson Bay, though only to a limited extent, owing to the visits of whaling ships and the establishment of whaling stations.

The Padlimiut and the Akudnirmiut.—The next tribes to be described are the Padlimiut and the Akudnirmiut, but this may be done very briefly, as the nature of this region is similar to that of Saumia. A peculiarity of the Akudnirmiut is their more decided migratory character as compared with the Oqomiut. They do not spend every winter at the same place, as we observed that the Oqomiut do, but

are more inclined to visit, in turn, the different winter stations of their country.

In summer the following places are almost always inhabited: Qarmaqdjuin, Eχaloaping in Padli Fjord, Qivitung, and Niaqonaujang. The deer hunting season opens here at the same time as farther south, but it is much facilitated from the fact that the ice breaks up later. The deer visit the numerous islands scattered along the mainland and thus their pasturing ground is easily reached. As the islands of Home Bay constitute a good hunting ground the Eskimo sometimes settle there for a few weeks.

The long, low peninsula Pamiujang, near Nedluqseaq, and the head of Nudlung are the favorite summer settlements of the Padlimiut. Nudlung, Eχalualuin, Ijelirtung, and Inugsuin are visited by the Akudnirmiut. An abundance of deer is found along the southern part of Home Bay, where the plains extend to the sea. It is remarkable that all along this shore there is no island on which birds build their nests. Though fowls do not form an important constituent of the food of the Oqomiut and the more southern tribes, the egg islands are frequently visited. On Davis Strait it is only by chance that ducks &c. are caught, and eggs can scarcely be obtained. The only island which is visited by birds is Avaudjelling, in Home Bay. In July, however, large flocks of eider ducks descend Itirbilung Fjord and many are caught near its head. From this fjord an overland route, which is practicable only in summer, leads to Piling, a district on the shore of Fox Basin, which may be reached in three days. Though the route is well known, it seems to be passing into disuse; at least I do not know any natives who have crossed the land by it. Another interesting road leading overland must be mentioned, namely, the one which leads from Nudlung and Eχalualuin to Majoraridjen and Nettilling. The former region is still visited by the Akudnirmiut, but I know of but one family who went to Nettilling and wintered there.

As a rule, about the beginning of August the Akudnirmiut move to Niaqonaujang in order to have an oppo tunity of meeting the whalers on their way south. For the same reason the southern families gather at Qivitung.

As soon as the sea is frozen up, part of the natives of Qivitung move southward and settle on Qeqertuqdjuaq, where they stay until February, while in spring some stay here or move farther up the bay, where they establish their huts on Qeqertaq; the rest travel to Padli Fjord and live with the families who had passed the winter there on Padloping. As the floe edge approaches the land here, the country is favorable for bear hunting, which is pursued in March and April. In June the natives move up Padli Fjord to catch salmon, which are found in enormous numbers at Padli. A few visit Agpan, where flocks of loons nest. The natives who intend to return to Qivitung in summer leave about the end of May or the beginning of June.

Those who remain at Qivitung during the winter go sealing in the bay east of the peninsula and subsist upon the product of this occupation, as well as on the walrus meat which was stored up in the summer and autumn. A few leave Qivitung after the consolidation of the floe and settle on Nanuqtaqdjung, an island in Home Bay, near the northern point of Qeqertalukdjuaq.

In the winter the Akudnirmiut of Niaqonaujang generally remove to Ipiutelling, on the southern shore of Koukteling, and in May go farther south, to the island Avaudjelling. In the spring they go bear hunting on Koukteling and the peninsula of Niaqonaujang, where the she bears dig holes in the snow banks, in which they whelp.

Though the isthmuses are of great value in facilitating the intercourse between the separate settlements of Cumberland Sound and Davis Strait, as their headlands are washed by water, they are not indispensable for the tribes of Davis Strait, for the ice is passable at all points. The low peninsulas are crossed by the natives in their travels in preference to rounding their headlands. Thus they not only shorten their journey, but they avoid the rough ice often found off the points.

For example, a pass leads from the western bay of Padli Fjord to Kangertloaping, and another from Tessiujang, near Qivitung, across the narrow and low isthmus into Home Bay. Similar passes are used in crossing Koukteling, the peninsulas of Niaqonaujang, Aqojang, and Aqojartung.

At Niaqonaujang I reached the limit of my travels and have only to add reports which I obtained from other tribes and in other settlements. River Clyde and Aqbirtijung are not always inhabited, but are visited at irregular intervals by the Akudnirmiut, the same who usually stay at Niaqonaujang. It is probable that Aqbirtijung and Kangertlualung are sometimes visited by the Tununirmiut of Pond Bay.

The Aggomiut.—I can say but little about the two subtribes of the Aggomiut (the Tununirmiut and the Tununirusirmiut), as the reports are scanty and the chart of the region is too incorrect to convey any exact information. A few statements may be derived from the Eskimo charts published by Hall (II, pp. 356 and 370). It appears that the natives winter near the entrance of Navy Board Inlet and in the back of Eclipse Sound. Settlements of the Tununirusirmiut at the western entrance of Admiralty Inlet and near its head are mentioned by Hall. Besides seals these natives also pursue the white whales and narwhals which frequent the sound. In summer the Tununirmiut live at the entrance of Pond Bay.

Although I am not informed as to the position of the settlements, and for this reason am unable to judge of the details of the life of the Aggomiut, I can give the more general facts of their relations to the neighboring tribes. Of the greatest importance is their connec-

tion with the Iglulirmiut, for through them a regular intercourse is kept up between the continent of America and the eastern shore of Baffin Land. One road leads through Kangertlukdjuaq, a fjord east of Parry's Murray Maxwell Inlet, to the head of Anaulereëling. I received a detailed description of this road from a native whom I met at Niaqonaujang. Hall's statement that this way leads to Pond Bay is very likely erroneous, as the natives probably said that it led to Tununirn, which comprises the whole district of Eclipse Sound and the region east of it. It is possible that another road leads to Eχaluin, a fjord of Eclipse Sound. Another route which is often used leads from Kangertlung, Parry's Gifford River, to Angmang, and farther west to Tununirusirn. This route has already been described by Parry, who attempted to reach the north shore of Baffin Land by it (II, p. 449). Parry's description was confirmed in 1869 by Hall (II, p. 356). I am somewhat doubtful whether Fury and Hecla Strait, which is often filled with rough ice, can be passed regularly, and whether a route leading to Tununirusirn follows the shore of the Gulf of Boothia, as stated by some of the natives of Davis Strait. This uncertainty did not occur to me until after I had read Parry's description. Communication between Tununirn and Tununirusirn is by way of the isthmus between Kangertlung and Navy Board Inlet.

The journeys of the Aggomiut are not at all confined to Baffin Land. In favorable winters they cross Lancaster Sound, passing the small island Uglirn, and winter on the eastern half of Tudjan (North Devon). While here they keep up some intercourse with the inhabitants of Umingman Nuna (Ellesmere Land).

It is said that they cross the ice covered island on sledges. In four days they reach the northern shore, whence a long, narrow peninsula, Nedlung, stretches toward Ellesmere Land. Through the narrow passage which separates Tudjan from Nedlung runs a very swift tide which keeps open a water hole throughout the winter. All around this place the ice wastes quickly in the spring and a large basin is formed which abounds with seals. Only that part of the peninsula which lies nearest North Devon is high and steep, presenting a bold face. Farther north it is rather low.

Having reached Umingman Nuna, the Eskimo who gave me this information affirm that they fell in with a small tribe who resided on this shore. Here they lived for some time, as there was an abundance of seals during the whole year. Farther northwest is a large fjord, Kangertluksiaq, off which an island is found, Qeqertakadlinang by name. The Eskimo do not visit the land on the other side of this fjord, as bears are said to be very numerous and large there. Though these migrations to Jones Sound do not occur very frequently, they have by no means been discontinued. For instance, a family which was well known to me has visited Smith Sound, and

the father of some friends of a resident of Cumberland Sound returned about fifteen years ago from a long stay on Tudjan and Nedlung.

The Iglulirmiut.—The last group of natives belonging to Baffin Land are those of Iglulik. Our knowledge of this tribe is due to Parry and Hall. As soon as the sea begins to freeze up, the natives gather on Iglulik, where they hunt the walrus throughout the winter. According to the position of the floe edge, Iglulik, Pingitkalik, or Uglit Islands are the favorite settlements. Later in the winter, when new ice is frequently attached to the floe, part of the families move to the ice northeast of Igluling, where seals are caught with the harpoon. Another winter settlement seems to be near Amitoq. In April young seals are hunted in the bays and fjords, particularly in Hooper Inlet. According to Hall the western coast of Melville Peninsula is sometimes visited during the winter for walrusing and bear hunting (II, p. 343). An overland route leads to this district, crossing the long Grinnell Lake and Brevoort River, thus named by Hall (II, p. 342). As soon as the warm season approaches the natives go deer hunting on Melville Peninsula or more frequently on Baffin Land. From the reports of Parry and Hall and from my own inquiries, there can be no doubt that they visit the eastern shore of Fox Basin.

The Pilingmiut.—Two tribes were settled on the eastern coast of Fox Basin, the Pilingmiut and the Sagdlirmiut, who had but slight intercourse with the Iglulirmiut. I heard both mentioned at times when traveling along Davis Strait. According to my information I should say that Piling is about 74° west and 69° north. From Parry's reports it appears that the intercourse between these tribes and Iglulik was not very active; for, although he had staid two years at Aivillik and Iglulik, the Pilingmiut when visiting the latter tribe did not know anything about this fact, which was one of the greatest importance to all the natives (II, p. 430). Sometimes the Talirpingmiut of Cumberland Sound meet the Pilingmiut, for both tribes go deer hunting northwest of Nettilling. I heard of one such meeting between hunting parties in that district.

The Sagdlirmiut.—The information as to the Sagdlirmiut is yet more scanty than that relating to the inhabitants of Piling. Parry learned that Sagdlirn is about east-northeast of Iglulik (II, p. 549). The description which I received on Davis Strait confirms this opinion, for the direction was denoted as qaningnang, i. e., east-northeast; besides, Sagdlirn was described as a long and narrow island.

WESTERN SHORE OF HUDSON BAY.

A remarkable difference exists between the customs of the western tribes who live on the continent of America and those of the tribes that inhabit Baffin Land and Melville Peninsula. This is chiefly

due to the difference in the nature of their territorial surroundings and to the presence of the musk ox, which they frequently hunt. In addition, the tribes of the continent do not hunt the seal in the winter, laying up instead their supply of meat and blubber in the fall. The information in regard to two of these tribes is quite complete, as they have been visited by explorers frequently and at all seasons. The two tribes referred to are the Aivillirmiut, of the northwestern part of Hudson Bay, and the Netchillirmiut of Boothia Felix. Unfortunately the information in respect to the others, the Kinipetu or Agutit, the Sinimiut, Ugjulirmiut, and Ukusiksalirmiut, is less complete.

The Aivillirmiut.—In order to describe the mode of life of the Aivillirmiut I shall give an abstract of Dr. John Rae's observations in 1846–'47 and 1854–'55, of C. F. Hall's life with these natives from 1864 to 1869, and of Lieut. F. Schwatka's residence among them from 1877 to 1879. A pretty correct idea of the migrations and favorite resorts of this tribe at the different seasons may be obtained from the journals of these travelers.

When Rae arrived in Repulse Bay in the latter part of July, 1846, he met with twenty-six natives who were deer hunting among the numerous lakes of Rae Isthmus (I, pp. 35, 40, 48). Another part of the tribe had resorted to Akugdlit, where they hunted the musk ox near Point Hargrave (I, p. 49). Committee Bay (Akugdlit) was filled with a heavy pack about that time, and the natives hunted walrus in their kayaks (I, p. 58). Wherever they killed a deer or musk ox they made deposits of the meat and carefully put up the walrus blubber in sealskin bags for use during the winter. When, about the end of September, the deer were migrating southward and new ice was forming on the lakes, the natives settled in the center of that part of the country which had been their hunting ground during the summer, in order to be near their depots. For this reason they were well scattered all over the country, some establishing their tents on the lakes of the isthmus, others staying on the shore of Repulse Bay, where large deposits of deer meat and blubber had been made. During the winter most of the natives gathered in one settlement east of Fort Hope (near Aivillik), whence they started to bring in their deposits. About the 20th of February they scattered all over the bay (I, p. 91), but it is doubtful whether they did this in order to be nearer their depots or to go sealing. In March the first deer of the season were seen (I, p. 93), but it was not until April that larger herds passed Repulse Bay on their migration northward (I, p. 99). At this time a small supply of trout was procured from Christie Lake, but it was not sufficient for the support of the natives (I, p. 99). Caches of venison were made and frequently visited until late in June (p. 166). The sealing had begun in the beginning of May (p. 135), when the first animals were seen basking on the ice. But

the Eskimo were now almost independent of their old food supply. When the salmon left the lakes and the deer were roaming among the hills the time of plenty was at hand. The salmon creeks were visited, deer were caught, and seals pursued on the ice (p. 170). Although the first deer were caught in traps in May, the principal season for deer hunting opened after the breaking up of the ice, when they were easily taken while crossing the lakes.

When Rae wintered the second time in Repulse Bay (1854–'55) he was much surprised to find no natives there. They had wintered farther south, and did not come to the bay until May, 1855, when they could catch seals on the land ice. In 1864, when Hall arrived at Wager River, Repulse Bay was again deserted. This year of Hall's stay in Hudson Bay is very instructive, as we learn from his account the particulars of the migration of the Aivillirmiut from Nuvung to Repulse Bay. The following facts are taken from his journal:

In June, 1865, a traveling party arrived in Repulse Bay (Hall II, p. 177), where numerous deer were met with. Their tents were erected on Uglariaq, whence seals were pursued, and they began at once to make blubber deposits (p. 179). They were very eager to store as much provision as possible, as there was no chance of obtaining a fresh stock at Repulse Bay during the winter. Some of the party brought their boats to the floe edge in order to follow the seal and walrus, which were swimming in the water or lying on the drifting ice in great numbers, while others preferred sledging on the land floe and shooting the basking seals (p. 181). After the breaking up of the ice, whales were seen, and kayaks and boats were made ready for their pursuit. In September most of the natives returned to North Pole Lake to hunt deer at the lower narrows (p. 202), where the meat was deposited for winter use (p. 204).

On the 19th of October the last deer was killed (p. 205), and most of the natives returned to the bay. They located at Naujan, the men in the party numbering 43 (p. 216). During the winter no kind of hunt was kept up, only a few salmon and trout being caught in the lakes (p. 210). Towards the latter part of March the settlement was broken up and its members scattered for the purpose of hunting and fishing (p. 227). Salmon were caught in North Pole Lake and deer shot in the narrow passes (p. 227). The sealing did not begin until the first of April (p. 239). In the summer, deer, seal, walrus, and salmon were caught in great abundance. In the following years the mode of life was about the same, but it may be remarked that in August the natives lived at Pitiktaujang and afterwards went to Lyon Inlet (Maluksilaq) to hunt deer (p. 323). Part of them returned to Repulse Bay, where walrus were caught on the drifting ice during September. In the ensuing winter (1867–'68) 55 natives had gathered in a village about twenty miles east of Fort Hope (p. 333), where they

lived on the stores deposited during the preceding summer. After the breaking up of the ice they succeeded in killing several whales, which afforded an ample supply of meat and blubber (p. 363). Subsequently, they hunted deer west of Repulse Bay (p. 364) and near Lyon Inlet, where probably the greater part of the families had staid since the previous year.

In November, Hall found near the head of this inlet a number of natives who came to Repulse Bay towards the end of the year, having heard that a whale had been taken there. By this addition the village of Repulse Bay suddenly increased in population to 120 inhabitants (p. 369). This was the only winter in which the natives began sealing in January (p. 371). In March they built their huts upon the ice and scattered early in the spring for sealing and catching salmon.

From these reports and some more general accounts of these travelers, an idea can be formed of the mode of life of this part of the Aivillirmiut during the different seasons. In the spring, when the seals commence to bask upon the ice, the tents are established on the floe of Repulse Bay, the large winter settlements being broken up into a number of smaller ones. During this season they begin to store away blubber, which is carefully put into sealskin bags. Besides, reindeer are killed in the deer passes. In July a great number of the natives leave the ice and resort to the salmon rivers, where an abundant supply of food is secured, but the sealing is also continued until the breaking up of the ice. At this time of the year (i. e., in August), walrus and seal are taken in large numbers, and thus an ample stock of provisions for winter use is collected. In some seasons a few whales are caught and stored away at once. In September, most of the natives move to the lakes or rivers, particularly North Pole Lake, to hunt deer as well as the musk ox on the hills. Other favorite localities for deer hunting are west of Repulse Bay or near Lyon Inlet. Large deposits of venison are made, and when the deer go south the natives settle in the center of their summer's hunting ground, building their snow houses on the lakes in order to have a supply of water near at hand. About January most of them gather in one settlement, which is established at Uglariaq, Naujan, or Inugsulik. Those who come from Lyon Inlet do not always join the Repulse Bay tribe, but may be identical with Parry's Winter Island Eskimo, who move to the bay south of Lyon Inlet in winter. They go sealing in winter only in case of need, for the hunt seems to be unproductive, and they subsist on the stores deposited during the preceding summer. Towards the latter half of March the settlements are broken up and some of the natives go to the lakes to fish for trout and salmon, while others begin the sealing.

Another winter station of the Aivillirmiut is Akugdlit, which, however, has never been as important as Aivillik itself. Rae found

some families here in August, 1846. They hunted the musk ox on the western shore of the bay, and later in the season, upon the pack ice which filled the sea, they hunted the walrus (Rae I, p. 58). They reported that the bay was very unfavorable for any kind of chase, as it is usually filled with closely packed ice, which prevents the visits of animals and endangers the boats of the natives (p. 49). In July the salmon creeks of Akugdlit (Committee Bay) were visited by these families, who extended their hunting ground from Colville Bay to the most northern parts of Melville Peninsula (p. 145). According to Hall a number of families live here at times. They were in the habit of staying at Repulse Bay during the early part of the summer and went to Akugdlit in the autumn to hunt the musk ox and deer. In the winter they transferred their deposits of blubber from Aivillik across the lakes to their settlement. Probably these families returned to Repulse Bay about the first of March, at which time their deposits were always exhausted (Hall II, p. 383). In some seasons the natives journey much farther south, that is, to the country between Cape Fullerton and Wager River. Klutschak's report upon this subject, which is extracted from his observations during Schwatka's search for the Franklin records, will be found tolerably correct (Deutsche Rundschau für Geographie und Statistik, III, 1881, p. 422). The report contains the following statement:

In the spring of every year these Eskimo live on the land floe of Hudson Bay, at some distance from the point where the tides and winds carry the pack ice past the shore. Here is the favorite feeding place of the walrus, and the Eskimo confine themselves to the pursuit of this animal. They settle near one of the numerous islands situated near the shore.

Later in the season they live in tents, and the hunting of seals and walrus is continued as long as the presence of ice permits. The greater part of the Aivillirmiut live near Depot Island (Pikiulaq). Here, on Cape Fullerton, and near the northern entrance of Chesterfield Inlet, the natives deposit their stores for winter use. As soon as the ice is gone they resort to the mainland, where deer, which descend to the shore at this season, are hunted. When the snow begins to cover the country they move inland, where they continue the deer hunt. In October they settle near a deer pass or a lake which is crossed by the herds migrating southward. In December all the deer have left the country and the natives live upon the stores deposited in the fall. Towards the beginning of the new year part of them return to the sea and live upon the deposits of walrus meat or disperse over the land floe, where seals are killed in their breathing holes. Another part take to the hills near Chesterfield Inlet and Wager River, a favorite feeding ground for the musk ox. They only return to the bay in March or April, to hunt seals until the breaking up of the ice. If the supplies of walrus meat are very abundant the Eskimo gather in one large settlement.

It appears from Klutschak's own journal that this report is not quite complete, and I shall therefore add those of his own observations which seem to be important:

The natives who had hunted deer in the fall returned in December to Depot Island, where ten inhabitants lived at that time. They hunted walrus at the edge of the floe during the whole winter, but did not exclusively use their old stores (Klutschak, p. 32). In summer whales were hunted by means of kayaks, the blubber and meat being immediately stored for future use p. 269). It is interesting to learn that a single family spent a whole year in the interior of the country, about two or three days' journey west of Depot Island, living on the flesh of the musk ox most of the time (p. 196). He does not say what kind of fuel they used.

In Klutschak's chart of Hudson Bay, which is published with his essay, a winter settlement is marked on Wager River, where the natives probably lived on seals caught in the breathing holes.

The mode of life of this tribe, as observed by Hall during his stay among them in 1864, differs in some material points from Klutschak's account. It is particularly important that Hall found them at Wager River.

About forty Eskimo are said to have lived in Nuvung during that year, while others were at Depot Island. Large depots of deer meat were scattered over the country around the settlement (Hall II, p. 76) and were brought in by the natives one by one. In the middle of November, after having finished the work of currying their deerskins, they commenced the walrus hunt, but meantime they frequently fed on deer meat from their depots (Hall II, pp. 102, 128, 132, 133). Towards the end of February they commenced to disperse, at first moving southward in order to be nearer the floe edge (p. 144). In the beginning of March an advance party of natives moved to Wager River, where they intended to catch salmon through the ice and to visit depots in that part of the country (p. 149). In April all the former inhabitants of Nuvung had settled on the ice of Wager River, where salmon in moderate numbers were caught (p. 164), but the main subsistence was the seals, which were at first watched for at the breathing holes, while later on they were killed when basking on the ice.

As a summary of the foregoing statements, we may say that the five principal settlements of the Aivillirmiut are Pikiulaq (Depot Island), Nuvung and Ukusiksalik (Wager River), Aivillik (Repulse Bay), Akugdlit (Committee Bay), and Maluksilaq (Lyon Inlet). They may be divided into two groups, the former comprising the southern settlements, the latter the northern ones. Every one of these settlements has certain well known sites, which are frequented at the proper seasons.

It yet remains to describe the roads which are used in the intercourse between these settlements. From Pikiulaq to Nuvung the natives travel by means of sledges. In the winter of 1864–'65 two journeys were made, the first in December, the latter in January. Besides, boats are used in traveling along the shore in summer. Sledge journeys from Nuvung to Ukusiksalik cannot be accomplished on the ice, as in the entrance of the bay large water holes are formed. The sledges follow a chain of long, narrow lakes beginning near Nuvung and running almost parallel with the coast through a deep gorge. The bay is but a short distance beyond this gorge. I am not acquainted with the sledge road from Nuvung to Aivillik. Rae was visited at Fort Hope by a number of Eskimo, who came by sledges from Nuvung in June (I, p. 169). Hall traveled with the natives in boats, passing the narrows and following the edge of the land ice, while the rest of the families sledged on the shore or on the land ice (II, p. 177). The principal road across Rae Isthmus leads over North Pole Lake and is described by Rae and Hall. The latter accompanied the natives on two sledge roads, the one leading from Sagdlua, in Haviland Bay, to Qariaq, in Lyon Inlet, the other crossing the land farther south. I am not sure whether a road leading from Nebarvik to Committee Bay connects Maluksilaq with Akugdlit. It is doubtful whether the coast between Aivillik and Gore Bay is visited by the natives.

It is remarkable that the Aivillirmiut very rarely go to Southampton Island, though they are sometimes carried across Frozen Strait or Rowe's Welcome by drifting ice. Scarcely ever of their own accord do they visit the island, which they call Sagdlirn. They know that it is inhabited, but have very little intercourse with its people.

The Kinipetu or Agutit.—The reports upon the Kinipetu or Agutit of Chesterfield Inlet are very scanty as compared with those of the beforementioned tribe. All authors agree that they differ materially in their habits from the Aivillirmiut, and it has often been affirmed that they scarcely ever descend to the sea. As there is, however, no other tribe mentioned south of the Aivillirmiut besides this one and as in every voyage to these shores, even far south of Chesterfield Inlet, Eskimo are met with who frequently visit Fort Churchill, the most northern station of the Hudson Bay Company, there can be no doubt that they also visit the shore and the islands and hunt seals. Probably the greater part of the tribe live inland from July to March, hunting deer and the musk ox, and in winter only descend to the sea in order to procure blubber and sealskins during the season in which these are most easily obtained. It may be that another part stay near the head of Chesterfield Inlet all the year round or remain in the hilly country between the deep gulf and Back River hunting the musk ox. According to all reports, they are rather independent of the hunt of sea animals, and they do not even use their

skins for garments (Klutschak, Deutsche Rundschau für Geographie und Statistik, III, p. 419). For this reason they would afford interesting material for investigation, and it is unfortunate that no trustworthy accounts of the tribe exist. Back, on his journey to the shores of the Arctic Ocean, found traces of the Eskimo on the lakes of Back River, ample proof that they were in the habit of visiting this region every summer. He found the first traces near 107° west longitude, and farther down, at the mouth of Baillie River. He did not see the natives whom Anderson and Stewart met in the summer of 1855 near McKinley River and later between Pelly and Garry Lakes. Their clothing and even the covers of their kayaks were made of deer and musk ox skins. They observed among these natives such articles of European make as the Hudson Bay Company used for barter and which were traded to the most southern Eskimo tribes of Hudson Bay. Therefore it is likely that these natives belonged to Chesterfield Inlet. This opinion is supported by Klutschak's remark that a native of the mouth of Back River knew an overland route leading from the lakes at its upper course to Chesterfield Inlet.

The Sagdlirmiut of Southampton Island.—Before leaving the subject of the Hudson Bay Eskimo I may mention the inhabitants of Southampton Island, a tribe which is almost unknown and the only record of which was obtained by Captain Lyon during the few hours which he passed among them in 1824 (Attempt to reach Repulse Bay, p. 54). In August he found a few families on the island south of Cape Pembroke, who were living upon salmon which had been deposited in stone caches and who had tents made of sealskins. A winter house was found at the same point. About 1865 an American whaling vessel found some natives on Manico Point living in five tents. Even then they had scarcely any iron, but used the old stone implements; this proves the want of all communication with the natives of the mainland. Parry found traces of Eskimo in York Bay and they have been seen on many other parts of the island. The Hudson Bay tribes call this tribe the Sagdlirmiut, i. e., the inhabitants of Sagdlirn, and their knowledge about them is very scanty, as they meet very rarely and by chance only.

The Sinimiut.—Northwest of Hudson Bay we find a tribe in Pelly Bay. The reports upon it are very scanty and it is difficult to find out the extent of the district which is occupied by it. Ross did not fall in with the tribe, and in the accounts of the Netchillirmiut on their journey to Repulse Bay no mention is made of an intervening tribe (II, p. 263). In April, 1847, Rae found signs of the tribe near Helen Island, in Pelly Bay (I, p. 113). There was an abundance of seals on the ice all around the islands (p. 111), but besides these they had large stocks of dried musk ox and salmon (p. 124). On his second journey he found their winter habitation on Barrow and Cameroon

Lakes (II, p. 938), and on the 20th of April he met with seventeen natives on the mainland west of Augustus Island, among whom were five women. In traveling farther west he fell in with a native who had been hunting the musk ox. On the 17th of May he found twelve natives settled in the same place and living on seal (II, p. 842).

Hall met with this tribe twice, in 1866 and in 1869. On the 28th of April, in his first attempt to reach King William Land, he found the Sinimiut settled near Cape Beaufort, in Committee Bay, where they were probably sealing (II, p. 255). No further account of this meeting is found except the remark that these natives were on their way to Repulse Bay (p. 259). Therefore it is rather doubtful whether the eastern shore of Simpson Peninsula belongs to their customary district. In April, 1869, on his second visit to Pelly Bay, Hall found their deserted winter huts on Cameroon Lake (p. 386). In the early part of the spring they had lived on the ice south of Augustus Island, the only place where seals could be caught, as the rest of the bay was filled with heavy floes which had been carried south by the northerly winds prevailing during the preceding fall. The natives themselves were met with on the mainland west of Augustus Island, where they were hunting the musk ox. When Hall crossed the bay in the first days of June the natives had changed neither their place nor their mode of subsistence.

There is a discrepancy in Nourse's extract from Hall's journal, for he sometimes refers to the Pelly Bay natives as different from the Sinimiut, while in other passages all the inhabitants of the bay are comprised in the latter term. I think this discrepancy is occasioned by the fact that a number of Aivillirmiut had settled in Pelly Bay and some others were related to natives of that locality; the latter Nourse calls the Pelly Bay men, the rest the Sinimiut. The place Sini itself, according to a statement of Hall, is near Cape Behrens, on the northwestern shore of the bay.

As the winter huts of the Sinimiut have been found four times on the lakes of the isthmus of Simpson Peninsula, we may suppose that they generally spend the winter there, living on the stores deposited in the preceding season and occasionally angling for trout and salmon (Rae I, p. 110) or killing a musk ox. In March they leave for the sea in order to hunt seals and to secure a fresh supply of blubber for their lamps. Their chief subsistence is the musk ox; besides, salmon are caught in great numbers, for they live on dried fish until spring (Rae I, p. 124).

BOOTHIA FELIX AND BACK RIVER.

The Netchillirmiut.—Following the shore westward we find the interesting tribes that inhabit Boothia Felix, King William Land, and the mouth of Back River. Among them the Netchillirmiut are the most important. Their favorite hunting grounds seem to have

undergone a remarkable change since they were first visited by Ross in 1829. At that period their district occupied the southern part of Boothia Felix, particularly the narrow isthmus and the adjoining parts of both coasts. They were acquainted with Bellot Strait (Ikerasaq), which they described as the way the Victory had to take in order to effect a passage to the western sea. A part of the tribe was in the habit of wintering on Owutta Island; they also probably visited the eastern part of King William Land. The southwestern termination of their district cannot be exactly defined, but from their description of the land south of Lake Willerstedt it appears that they visited Shepherd Bay; besides, I find that in June, 1831, a number of families lived south of Netchillik, i. e., probably in Rae Strait or on Shepherd Bay (Ross II, p. 537).

So far as can be gathered from Ross's account the tribe had three winter settlements, one on the eastern shore of the Isthmus of Boothia, another at Lake Netchillik, and the third on Owutta Island.[1] As to the first meeting of the natives with the Victory two contradictory accounts are found. At first it is related (p. 252) that they came from Akugdlit, having been on the road ten days. Later, and this is more probable, it is said that two natives had descried the ship in September, 1829, when passing near Victoria Harbor (p. 309). Being in great fear, they had immediately traveled to Netchillik to communicate with their countrymen. There they met with a woman who had been on board of Parry's ships, and she had induced all the natives, by her stories, to be on the lookout for the Europeans. At the first meeting, on the 9th of January, 1830, 31 men approached the ship. This would answer to a population of about one hundred and twenty persons, and it is quite unprecedented that such a party should travel for any distance and even beyond the limitations of their own territory and of their customary migrations. Probably a traveling party had joined the Netchillirmiut, who had lived somewhere in Lord Mayor's Bay, and they all went to meet the ship.

From Ross we also learn that during January and February these natives lived on seals, which were killed with harpoons (pp. 250, 255, 259), but, in addition, they had deposits of venison, seal blubber, and fish (pp. 251, 262). Sometimes they went hunting the musk ox on the mainland farther north, and a small party may have staid there throughout the winter (p. 265). In the first days of March they began to scatter all over the ice (p. 290), in order to have a better chance of sealing and of catching young seals in the white coat (pp. 293, 295). The young sealing commenced about the 10th of March. It is worth remarking that this is the only tribe on the continent of

[1] From a rather ambiguous statement (p. 355) it would seem that Owutta belongs to the territory of the Ugjulirmiut; but in later passages ample proof is found that it is inhabited by the Netchillirmiut (pp. 423, 427). I myself was formerly misled by the above passage (Zeitschr. Gesell. Erdk., p. 171, Berlin, 1883).

America which pursues the young seal; they are enabled to do this by the extent of the land floe in the large bays. In the last days of March some of the natives started for Sarvaq and Netchillik to fetch their kayaks (p. 315), which they had left there the preceding season. As they intended to hunt deer at the lakes farther north, they were obliged to have their boats at hand at the breaking up of the ice. The further the season advanced the more the settlements were broken up (p. 338), and towards the end of April the first families left for Netchillik to join the other part of the tribe (p. 323). At this season the musk ox and the returning reindeer were frequently hunted (pp. 252, 335, 349). In the first days of May some of the natives went to Netchillik (p. 337), and another party followed a month later (p. 383). They stopped on Middle Lake for a short time to fish for trout (p. 384). A number of families remained near the ship, sealing, catching salmon, and hunting the musk ox (pp. 436, 441, 450, 453) until the beginning of July, when the fishing season ended and they went to the inland lakes to hunt deer and fish for trout in the rapids between the lakes (p. 450). In the summer their principal fishing stations were Lindsay River and Sarvaq.

The other part of the tribe which had lived at Lake Netchillik were even more numerous than that of the coast, as 21 snow houses were found which had been inhabited by them during the winter (p. 389). The number of inhabitants of this village was about one hundred and seventy, and, since there were a few who lived on Owutta Island and yet others who may have been scattered in different parts of the country, it is probable that the whole tribe numbered 350 persons.

As they were seen only a few times by the expedition the reports are rather incomplete. In the winter they lived on a plain, which was called Okavit, on the eastern shore of Lake Netchillik (p. 315). The exact position cannot be learned from Ross's journal. As some mention is made of blubber deposits at Netchillik (p. 388), it is probable that they lived on stores deposited in summer. Toward the end of May and in the beginning of June they were met with at Spence Bay and Josephine Bay. One of their stations was on the island Inugsulik, near Padliaq, the head of Spence Bay. Here their principal food was codfish, which they caught in holes cut through the ice, while the sealing was there a less important interest (pp. 391, 426). The kayaks which were found deposited on the west shore of Boothia as far as Josephine Bay proved that they resorted to this region in the deer hunting season (pp. 406, 407). The families who had been at Owutta during the winter of 1829–'30 were found in June, 1831, in Padliaq, whence they crossed the isthmus and visited Tarionitjoq (p. 431).

In 1830 no natives were seen after the usual time of their departure for the interior of the country, and it was not until April, 1831, that

they were found again. They had wintered at Lake Avatutiaq, on the eastern shore of Boothia (p. 511), where they had lived on a large stock of salmon caught in the fall (p. 531) and on musk oxen which were hunted during the entire year in the hilly country near the lakes. Others had wintered farther south, on Lake Owen (p. 524). A portion of these Eskimo set out for Netchillik in April (p. 522), while the others remained in Tom's Bay and subsisted upon codfish, salmon, and seals (p. 546).

In June another party left for Netchillik, whence some of the natives, who had not seen the ship before, arrived at Victoria Harbor in July, probably having heard of her new station at this place through the returning families (p. 577). In August the last of them left, going west (p. 592).

Though these reports are rather imperfect, they enable us to get a fair idea of the mode of life of this tribe.

In the large bays on the eastern side of the isthmus the natives live just as do the southern tribes of Baffin Land, pursuing the seal at its breathing hole during the winter. Here, as everywhere else, the settlements were broken up early in the spring. The fishing is commenced remarkably early, while in the east scarcely any salmon are caught before the breaking up of the lakes. West of Melville Peninsula the fishing is commenced in March or even earlier. On Boothia the most important means of subsistence for the natives is the codfish, on which they live during the spring and probably during a part of the winter. It is also an important article of food for the other tribes of this region, while farther east it is of no importance. The salmon fisheries of Boothia are very productive, of which Netchillik and Padliaq in Josephine Bay, Stanley and Lord Lindsay Rivers, Qogulortung, Angmalortuq, and Sarvaq may be considered the most important. Deer are hunted while swimming across the numerous lakes of Boothia, and the musk ox in the granite hills of its northern part. Here is also another winter resort of the tribe, from which the island Tukia, north of Lake Avatutiaq, is visited in summer, to collect pyrite or native iron (p. 362), which is used for kindling fire. The life of the western part of the tribe, as far as we are acquainted with it, was described in the foregoing paragraph.

Neither Dease and Simpson, who visited Castor and Pollux River in 1839, nor Rae, on his second voyage to Boothia, met the natives themselves; the latter, however, saw their marks on the islands of Acland Bay (II, p. 840).

The next traveler who fell in with the tribe was M'Clintock, who visited King William Land in search of the Franklin records. In February, 1859, he met several families near Cape Adelaide (p. 230). They traveled during the spring all along the shore and had been near Tasmania Islands in March and April. They were seen by him on their return journey to Netchillik, near Cape Nicholas. They

traveled slowly south, hunting seals. They knew the coast as far as Bellot Strait and were able to name every cape of this district. A few families who had wintered in company with this party at Cape Victoria had returned to Netchillik when the other parties started north (p. 253). On the 4th of May, twenty deserted snow huts were found on the southwest point of Matty Island (p. 257). From the direction of the sledge tracks, M'Clintock concluded that the natives who had formerly lived here had gone to Netchillik. On the 7th of May a settlement of 30 or 40 individuals was found on the eastern coast of King William Land (p. 260). This party had not communicated with the villages on the mainland of Boothia since the preceding fall (p. 260.)

An interesting change in the territory which is inhabited by this tribe has occurred since Ross's visit to this country. In order to describe it more fully, I must refer to the relations of the Netchillirmiut to the Ugjulirmiut. At this early period the intercourse between the tribes of Ugjulik and Netchillik was of little consequence. No European had ever been in their districts, which included Adelaide Peninsula and the southern shore of King William Land (Ross II, p. 317), but quite a number of persons were known to the Netchillirmiut (p. 357), who had met them in their trading excursions. In addition to this, a young single man of Ugjulik had been adopted by a Netchillirmio who lived on the eastern coast of King William Land and on Owutta Island (p. 355). When the Franklin expedition perished on King William Land, in 1848, the Netchillirmiut had not yet visited that part of the country. From Schwatka's inquiries we learn that the tribe that found Crozier and his fellow sufferers did not extend its migrations beyond Adelaide Peninsula and the southern shore of King William Land. In the summer of 1848 they attempted in vain to cross Simpson Strait, and were compelled to stay on the island. They traveled all over the country as far as Peel Inlet, opposite to Matty Island (Gilder, p. 91). Hence it is obvious that the Netchillirmiut, up to the time of the Franklin catastrophe, lived in their old territory, as the inhabitants of Boothia in 1859 had only indirect news of the shipwreck.

When the Ugjulirmiut obtained an enormous stock of metals and wood by the destruction of Franklin's ships, the Netchillirmiut commenced to visit King William Land, in order to partake also of these riches. Thus they began, by degrees, to move westward, and became intermingled with the Ugjulirmiut. Hall mentions quite a number of Boothians who had met Ross on the eastern shore of the isthmus, though they were living on King William Land at that time (Hall II, p. 405). Besides, according to all accounts, the number of women is much smaller among the Netchillirmiut than that of men, and these are obliged to look for wives among the neighboring tribes, particularly among the Ugjulirmiut. As these do not differ in the fashion

of their clothing and tattooing from the Netchillirmiut, it is scarcely possible at the present time to separate the tribes. It is worth remarking, however, that Gilder and Klutschak use both terms, and therefore I conclude that the natives themselves are conscious of belonging to different tribes.

Schwatka describes the limits of their territory as he learned them from his observations in the summer of 1879 (Science, December 19, 1884, p. 543). He found them on the mainland opposite King William Land and along the islands in the vicinity of Simpson Strait. They were most numerous along the northern shores of Adelaide Peninsula, their villages being scattered every few miles along the coast from Montreal Island to Smith Point. On the chart accompanying this account the eastern shore of the Back River estuary is included in the district inhabited by the Netchillirmiut.

It is important to compare this description with the observations which were made by Hall in 1869. He found the first traces of natives at the very head of Shepherd Bay, where a sledge track was observed (p. 395). Near Point Acland several snow huts and a number of natives were met with on the 30th of April (p. 396). Farther west he found a village on Point Booth (p. 397), but the most interesting fact is that in May, 1869, the party had fresh salmon from Netchillik (p. 400). This statement is decisive of the question whether the Netchillirmiut still continued their visits to the isthmus from which they take their name.

From Klutschak's journal a few more details may be gathered. From it we learn that in summer the Netchillirmiut scatter, and, while some go sealing near Montreal Island (p. 75), many others go inland to hunt deer in the lakes of the peninsula and farther south (p. 119). A third party resort to King William Land, the southern shore of which they frequent until September, while the more northern parts are seldom visited (p. 79). At this season they leave the island and all return to Adelaide Peninsula (p. 126). I suppose, however, that this report does not refer to the whole tribe, but that another party visited Shepherd Bay in winter. It seems to me very improbable that in the interval between 1869 and 1879 a total change should have occurred. In the spring they catch salmon, which are dried and stored to be used in winter. Their stock of blubber and deer meat is sufficient to last them during the greater part of the winter. At this season they fish only in holes made through the ice. Important winter settlements are at Point Richardson and at the outlet of Qimuqsuq (Sherman Inlet), where all the deer needed are caught in the fall while they are crossing the bay.

Although these statements do not altogether harmonize, it appears, notwithstanding, that King William Land and Adelaide Peninsula, which were not visited by the tribe in the early part of our century, became its favorite hunting ground after the loss of the Franklin

expedition. Since that period the more northern parts of Boothia may have been abandoned by the natives, though no certain proof of this can be offered. Netchillik itself and the more southern parts were visited up to 1869, and probably they are yet inhabited by the Eskimo. This cannot be said with positiveness, however, for this part of the country has not been visited since the times of Ross and M'Clintock. The migration of the natives was caused, without doubt and as we have already remarked, by the profusion of metals and wood obtained from the wrecks and the starved traveling parties.

The Ugjulirmiut.—Several important facts regarding the Ugjulirmiut are mentioned above. Dease and Simpson found their first traces on the western shore of Adelaide Peninsula. From Ross's account (I, p. 427) it appears that their territory was the same at that period as it is now, and M'Clintock's meeting with them on the shore of King William Land may be adduced as a proof of this. Their old country is now inhabited by both Ugjulirmiut and Netchillirmiut. Therefore their mode of life is identical and requires no comment. Visits to the northern parts of King William Land have been very rare, but it was on one of these that Franklin's ships were discovered (Klutschak). They rarely went hunting beyond Cape Herschel, but looked for driftwood on the northern shore of the island.

The Ukusiksalirmiut.—The last tribe of the Central Eskimo, the Ukusiksalirmiut, inhabit the estuary of Back River. They were met by Back and by Anderson and Stewart. Recently Schwatka and his party communicated with them on their visit to King William Land. Klutschak affirms that they are the remains of a strong tribe which formerly inhabited Adelaide Peninsula but was supplanted by the Netchillirmiut and the Ugjulirmiut. Klutschak calls them Ukusiksalik; Gilder, sometimes Ukusiksalik, sometimes Ugjulik. The latter author relates that a single family living on Hayes River (Kugnuaq) had formerly had its station on Adelaide Peninsula, but had retired to this country when the warlike Netchillirmiut began to visit King William Land and Adelaide Peninsula. Schwatka could identify the same man with one of those whom Back had seen in the estuary of the river in 1833 (Gilder, p. 78). Therefore they must have lived in this district a long time before the Netchillirmiut began to move westward. According to Back the party with which he fell in did not know the land beyond the estuary of Back River, which indicates that they were neither from Ugjulik nor Netchillik. As the Ugjulirmiut lived on Adelaide Peninsula when Ross wintered in Boothia, I do not consider it probable that the Ukusiksalirmiut ever lived in that part of the country, and I cannot agree with Klutschak. I may add Parry's remark, that beyond Ukusiksalik (Wager River) another Ukusiksalik (Back River) was known to the natives of Winter Island.

The reports on their mode of life are very deficient. They were met by Schwatka a little above the great bend of Hayes River in May, 1879; he also met another party in December at the Dangerous Rapids of Back River. Schwatka counted seven families at the former and nine at the latter place. Their principal food consisted of fish, which are caught in abundance in Back River (Klutschak, p. 164). It is said that they have no fuel during the winter. Undoubtedly they use some kind of fuel, and I rather doubt the implication that they do not hunt seals at all. The musk ox and fish, however, are their main food, according to both Klutschak and Gilder. It is very remarkable that all the natives west of Boothia depend much more on fish than do any other tribes of the Central Eskimo.

A word in regard to the roads used in the intercourse between the tribes. From Akugdlit a road leads over the lakes of Simpson Peninsula to Pelly Bay. Rae and Hall traveled over it on their journeys to the northwest and it was used by the Sinimiut when they visited Repulse Bay in 1866. From Pelly Bay two roads lead to Netchillik and the estuary of Back River, the one following the east shore of the Boothia, the other running to Lake Simpson, whence the valley of Murchison River facilitates the access to Inglis Bay. The Isthmus of Boothia is crossed by the two chains of lakes discovered by Ross. In visiting the northeastern part of the peninsula the natives ascend Stanley River and cross the lakes farther north. Between Netchillik and Ugjulik the Eskimo pass by Owutta Island to Peel Inlet, whence they travel overland to the south shore of King William Land and cross Simpson Strait. Another road leads from Cape Colville to Matheson Point, following the south shore of King William Land. In traveling from Ugjulik to Back River they use Sherman Inlet and the adjoining isthmus. It is probable that Back River is visited by natives belonging to Wager River. The existence of a communication between Back River and Chesterfield Inlet is proved by Anderson and Stewart, who found Eskimo at Lake Garry, and by a remark of Klutschak (p. 170), who learned from a native of Back River that Chesterfield Inlet could be reached from the upper part of that river. It is quite probable that thus an immediate though limited intercourse is kept up between the Kinipetu and the Ukusiksalirmiut.

SMITH SOUND.

The natives of Ellesmere Land.—Last of all I have to mention the natives of Ellesmere Land and those of North Greenland. Although the latter are not generally considered as belonging to the central tribes, I find that their habits and their implements resemble those of the Central Eskimo rather than those of the Greenlanders,

and therefore a brief mention of them will not be inappropriate. The inhabitants of Umingman Nuna (Ellesmere Land) probably live on the southern shore, near the western part of Jones Sound, and, according to Bessels's and my own inquiries, they travel all around this island, passing by Hayes Sound.

The North Greenlanders.—The North Greenlanders live in the sounds of the peninsula between Melville Bay and Kane Basin, hunting seals on the smooth floes of the bays and pursuing walrus at the floe edges. They make large deposits of the blubber and meat obtained in the fall, on which they live during the winter. They also pursue seals in winter with the harpoon. In summer they hunt reindeer on the mountains adjoining the inland ice.

INFLUENCE OF GEOGRAPHICAL CONDITIONS UPON THE DISTRIBUTION OF THE SETTLEMENTS.

In considering the distribution of the tribes it is evident that they are settled wherever extensive floes afford a good sealing ground during the winter. The Sikosuilarmiut live on the large bay east of King Cape, which is sheltered by numerous islands. The Akuliarmiut are settled near Lesseps and North Bays. I am unable to say whether there is a floe near the winter settlement of the Qaumauangmiut, as there are no reports upon the subject. Probably ice is formed in the sound, which is protected by the Middle Savage Islands, and besides it may be that the natives move to North Bay. The important tribe of Nugumiut lives on Frobisher Bay and the adjoining Grinnell and Field Bays. On the largest floe of this part of the country, in Cumberland Sound, including Lake Nettilling, the largest tribe is settled: the Oqomiut. On Davis Strait ice floes are formed between Cape Mickleham and Cape Mercy, in Exeter Sound, and between Okan and Bylot Island. The tribes are distributed accordingly: the Saumingmiut of Ukiadliving, the inhabitants of Qarmaqdjuin with their winter settlement in Exeter Sound, and the Padlimiut and the Akudnirmiut farther north. The immense land floe of Davis Strait is not so valuable a hunting ground for the Eskimo as Cumberland Sound, the ice being very rough a few miles from the coast and at some places even close inshore. When the sea begins to freeze in the fall the newly formed ice is broken up by severe gales and by the currents and is piled up into high hummocks before it consolidates. The sealing on rough ice during the winter is very difficult and unsuccessful, as it is hard to find the breathing holes and the traveling is very laborious. It is only in the northern parts of Home Bay and in the large fjords that smooth ice is formed. The settlements of the natives are manifestly distributed in accordance with these facts. In every place where smooth ice is formed we find that natives either are settled or have been settled. Aqbirtijung, River Clyde, Ijellir-

tung, Home Bay, Brodie Bay, Merchant Bay, and Padli are the only places along the shore of Davis Strait where smooth ice occurs. On the long shores between them, which are unsheltered from winds and currents, the ice is always very hummocky, and, therefore, the natives do not settle upon them in the winter. In the far north, extensive floes of smooth ice are formed in Eclipse Sound and Admiralty Inlet.

Concerning the country farther west the reports are rather scanty. The southwest shore of Baffin Land and the eastern entrance of Fury and Hecla Strait are always frozen over and afford a good hunting ground. On the mainland, the large floes of Repulse Bay and Wager River, Chesterfield Inlet and the bights all around it, Pelly Bay and the narrow bays adjoining Boothia Peninsula, and the mouth of Back River are important places for the distribution of the Eskimo.

There are only a few districts where the proximity of open water favors walrus hunting during the winter, and all of these have neighboring floes on which seals may be hunted with the harpoon. These places are Sikosuilaq, Akuliaq, Frobisher Bay, Iglulik, the west shore of Hudson Bay, and Smith Sound. As to the remainder the Eskimo live altogether independent of the open water during the winter.

Generally speaking, two conditions are required for winter settlements, viz, the existence of an extensive floe and smooth ice.

The different mode of hunting in the spring causes a different distribution of the settlements. During this season those regions which had been deserted during the winter are most visited by the hunters. On light dog sledges they travel over the rough ice and along the shores of the fjords and islands. The natives who lived in large settlements during the winter are spread over the whole country, in order that every one may have a better chance of traveling over his own hunting ground. In a few places the young sealing induces the Eskimo to leave the winter settlements; in other places the kayaks are prepared for visiting the floe edge, and bears and the returning birds are hunted.

Though the greater variety of food which is to be obtained and the difference in the methods of hunting in the spring require the dispersion over a wide area of the families which had kept together during the winter, the selection of places for the new settlements remains wholly dependent upon the state of the ice.

After the ice breaks up, the distribution of the deer regulates the location of the summer settlements. While during the winter the state of the ice is of decisive importance, the orography of the land comes now into consideration.

Wherever deep valleys give access to an extensive area, wherever practicable roads enable the natives to ascend the plateaus, summer settlements are established. The heads of the fjords are favorite

places, as they abound with salmon. The adjoining valleys and the peninsulas which they form give the best chances for a successful deer hunt. These facts are most apparent on the coast of the steep highland of Nugumiut, over which numerous herds of deer roam.

A great influence is also exerted by the extensive plains of the western part of Baffin Land, which abound in deer. We observe that a number of tribes visit these districts, though their winter stations are at a great distance. The Akuliarmiut of Hudson Strait and the Nugumiut travel to Lake Amaqdjuaq, the Oqomiut stay on Lake Nettilling, and the Akudnirmiut visit Majoraridjen. In the same way all the tribes of Hudson Bay visit the land farther west, which is frequented by herds of the musk ox, and they go even as far as Back River. This important fact shows the attraction which is exerted by a rich country on all the tribes of the neighboring districts.

TRADE AND INTERCOURSE BETWEEN THE TRIBES.

In treating of the single tribes, the routes were mentioned which are followed by the natives as they travel from shore to shore and from settlement to settlement. These routes are established by tradition and the Eskimo never stray from them. In order to obtain a more thorough understanding of the migrations of single individuals and of families, the relations between the tribes and the settlements must be discussed.

By the lively intercourse which is always kept up between the settlements, it cannot fail that marriages between members of different tribes should be of frequent occurrence and that many ties of affinity and consanguinity should thus be created. These relations, however, as distances increase, quickly become less common. For instance, in Cumberland Sound three people are found belonging to Tununirn, about ten belonging to Akudnirn, and quite a number coming from Padli. Also, two Sikosuilarmiut live there, a few natives of Akuliaq and Qaumauang, and very many Nugumiut. Hall's accounts concerning the Nugumiut and the Aivillirmiut prove a similar proportion of strange natives among these tribes. Every tribe may be said to bring together its immediate neighbors, as it is closely related to them, while those which are separated by the tribe itself are strangers to one another. The importance of this mediate position is regulated by the strength of the tribe, by the significance of the country in reference to its produce, and by the routes crossing it.

Thus, the Sikosuilarmiut and the Nuratamiut are closely connected, and may be considered as forming one group with the Akuliarmiut. The Sikosuilarmiut have intercourse with the Igdlumiut, the inhabitants of the northern shore of Labrador. According to Lucien M. Turner, three tribes may be distinguished there as inhabiting the

shores of Ungava Bay and the eastern shore of Hudson Bay. This report differs somewhat from the accounts of the Moravian missionaries who have intercourse with the inhabitants of Ungava Bay near Cape Chidleigh. From their reports four tribes may be distinguished: the Kangivamiut of George River, the Kouksoarmiut of Big River, the Ungavamiut of Hope Advance Bay (which is properly named Ungava), and the Itivimiut of Hudson Bay. I am rather undecided whether Ungava is a bay or a large strait separating Cape Wolstenholme and the adjacent land from the continent, as the name Ungava is also reported south of Cape Wolstenholme. The inhabitants of this shore are the Itivimiut of the Labrador Eskimo and the Igdlumiut of the natives of Baffin Land. Probably the intercourse between Sikosuilaq and Cape Wolstenholme is of no great importance. The Sikosuilarmiut visit Trinity Islands (Nanuragassain) in skin boats to hunt walrus and cross by the three islands Tudjaraaq'djung, Akugdlirn, and Tudjaqdjuara'lung to the opposite shore of Hudson Strait. The passage across the strait is considered very dangerous, and therefore is rarely undertaken. The natives do not utter a single word during the long passage; they believe a destructive gale might be conjured up if they did. Only once have natives been met with on Salisbury Island (Lyon, Attempt to reach Repulse Bay, p. 128), but it is doubtful whether they belonged to the northern or to the southern shore of the strait. As for the rest, the passage is only known to me by reports I received in Cumberland Sound, which were confirmed by the whalers visiting the northern shore of Hudson Strait. I do not know whether any intercourse exists between Sikosuilaq and Southampton Island. It is worth remarking that on Mansfield Island numerous ruins of Eskimo habitations have been found (Gordon, Report on the Hudson's Bay Expedition, 1884, p. 38).

The Qaumauangmiut are connected with the Nugumiut in the same manner as with the Akuliarmiut, and many are said to winter near North Bay, which is also visited by the Akuliarmiut. From Hall's reports it would appear that many are settled in Frobisher Bay.

At present the intercourse between the Nugumiut and the Oqomiut is of no significance, as many years may pass without a journey being made from one tribe to the other. Formerly, when many whalers visited Cumberland Sound and Field Bay, a number of Nugumiut immigrated to the sound, and consequently almost half of the Eskimo now settled on the western shore of Cumberland Sound were born in Nugumiut or Ukadliq. At the same time many Oqomiut settled among the Nugumiut. That period was doubtless an exceptional one; at any rate, the long stretch of uninhabited shore between the settlements of the two tribes is not favorable to intimate intercourse. Indeed, even now the Nugumiut are considered strangers in the sound, and, notwithstanding the existence of many intermarriages between the tribes, a number of families are not at all acquainted

with one another. It is remarkable that the number of natives born in Nugumiut is much larger on the western shore than on the eastern. They seem to have joined their nearest neighbors, the southern Talirpingmiut, perhaps for the reason that in their district the geographic character of the land is most similar to that of Frobisher Bay. The number of Nugumiut settled among the inhabitants of Nettilling Fjord and among the Kingnaitmiut is far less. Among the Saumingmiut there is no one who has traveled beyond Naujateling, and in Padli or farther north there are very few individuals who have been south of Cumberland Sound. It is only by careful consideration of the birthplace of the different individuals who are members of the settlements of Cumberland Sound that it is possible at the present time to detect the former division of the Oqomiut into subtribes. The inhabitants of the eastern shore are related to the Padlimiut and the Akudnirmiut; those of the western shore, to the Nugumiut. In 1840 a brisk intercourse existed between Padli and the sound (Eenoolooapik, p. 81), and probably sledges crossed the peninsula every winter. Though the intercourse is not so intimate to-day as it is between the settlements of the sound, it is yet active. The Kingnaitmiut form the medium of the regular intercourse between Saumia and Padli, while families removing to Akudnirn travel along the shore of Davis Strait. Among the subtribes of the Oqomiut the Saumingmiut are most nearly related to the Padlimiut and extend their migrations farthest to the north.

The Akudnirmiut, who are closely connected with the Padlimiut, are considered strangers by the Oqomiut. The intercourse between the Akudnirmiut and the Aggomiut is not very frequent, and seems to be maintained as irregularly as that between the Nugumiut and the Oqomiut.

The inhabitants of the northern sounds and of Fury and Hecla Strait frequently visit one another. Parry mentions a number of journeys in each direction (II, p. 436). Hall found natives of Tununirn and Tununirusirn settled in Iglulik (II, p. 356). I myself found two Iglulirmiut among the Akudnirmiut. The intercourse seems to have been always very active, and consequently those tribes may be considered as one group.

The inhabitants of North Devon belong to the Tununirusirmiut, a few families of this tribe sometimes settling on the island and after a few years' absence returning to their former home.

From Parry's, Hall's, and Schwatka's reports it appears that the Aivillirmiut are closely related to the Iglulirmiut, while the Eskimo of Chesterfield Inlet, the Agutit or Kinipetu, form a separate group.

It is remarkable that between the tribes of Hudson Bay and the more western ones a deep distrust exists, which prevents a frequent and unlimited intercourse. The Sinimiut and Netchillirmiut are

feared by the Aivillirmiut, though intermarriages and removals from one tribe to the other are not rare. No doubt they are less closely related than are the neighboring tribes hitherto mentioned. Unfortunately, too little is known of the western tribes to admit of a decided opinion whether or not there exists an important difference in customs and habits. The Sinimiut, the Netchillirmiut, and the Ugjulirmiut may be comprised in one group, for they all hold frequent intercourse with one another and the last two even inhabit the same region at the present time. The change which the relations between these tribes have undergone since 1833 has already been referred to, as has their intercourse with the Ukusiksalirmiut. Schwatka (Science, Vol. IV, p. 543) states that they occasionally meet the Qidneliq of Coronation Bay, but that both tribes distrust each other. Our knowledge about the migrations from North Devon to Ellesmere Land and North Greenland is very scanty, but it is necessary to mention its existence.

Between tribes that are strangers to one another ceremonies of greeting are customary which are not adapted to facilitate intercourse. The ceremonies will be described further on (see p. 609). For the present it will be sufficient to say that duels, with varying details, are common between a stranger and a man of the tribe, and these sometimes result in the death of the former.

Among neighboring tribes these ceremonies are dispensed with, for instance, between the Padlimiut and Oqomiut, Padlimiut and Akudnirmiut, while a Nugumio or an Akudnirmio unknown in Oqo has there to go through the whole of the performance. The exception in favor of the former tribes is doubtless due to the frequent intermarriages with those tribes, whereby a constant acquaintance is kept up.

Real wars or fights between settlements, I believe, have never happened, but contests have always been confined to single families. The last instance of a feud which has come to my knowledge occurred about seventy years ago. At that time a great number of Eskimo lived at Niutang, in Kingnait Fjord, and many men of this settlement had been murdered by a Qinguamio of Anarnitung. For this reason the men of Niutang united in a sledge journey to Anarnitung to revenge the death of their companions. They hid themselves behind the ground ice and killed the returning hunter with their arrows. All hostilities have probably been of a similar character.

One tradition only refers to a real fight between the tribes. On the steep island Sagdluaqdjung, near Naujateling, ruins of huts are found on the level summit. They are said to have been built by Eskimo who lived by the seashore and were attacked by a hostile tribe of inlanders. The tradition says that they defended themselves with bows and arrows, and with bowlders which they rolled down upon the enemy. The occurrence of huts upon the top of an island is very unusual, and this tradition is the only one referring to any kind of fights or wars. Even the tradition of the expulsion of the Tornit a

fabulous tribe said to have lived with the Eskimo on these shores, does not refer to a combat. The details of this tradition will be found in a subsequent chapter.

I wish to state here that my inquiries and my understanding of the facts as they have been reported by other travelers do not agree with the opinions given by Klutschak (Deutsche Rundschau für Geographie und Statistik, III, p. 418), who claims for the Eskimo of the west shore of Hudson Bay reservations which are limited by precise lines of demarkation. In comparing this statement with his own and with Gilder's narratives I am led to believe that the relations between the tribes are the same in these regions as they are farther east. This opinion is strengthened by Dall's remarks on the Alaska tribes (Science, p. 228, 1885).

The reasons for the frequent removals of individual Eskimo to strange tribes are to be looked for in the customs of the natives. I can only mention here that intermarriage, adoption, and the fear of blood vengeance are the principal ones.

It is peculiar to the migratory habits of the Eskimo that almost without exception the old man returns to the country of his youth, and consequently by far the greater part of the old people live in their native districts.

During the last decades the most important inducement to removals has been the presence of the whalers in certain parts of the country. Since the beginning of our century their fleets have visited the west shore of Baffin Bay and Davis Strait, and thus European manufactures have found their way to the inhospitable shores of the Arctic Sea. The most valuable objects which were bartered were metals and wood. The value of the former may be seen in its economical application for knives and harpoon heads. By means of this trade the Akudnirmiut and the Tununirmiut became far superior to the Oqomiut and the Iglulirmiut, with whom they traded extensively in dogs, skins, &c. The Akuliarmiut and the Qaumauangmiut also enjoyed the advantages which accrued from trade with the ships of the Hudson Bay Company.

When the whalers became better acquainted with the natives and the peculiar jargon which is still in use was developed, the traffic became very active, and reached its height after Cumberland Sound was rediscovered by Penny. As soon as the whalers began to winter in the sound and to employ the natives the latter received firearms and European boats in exchange for their wares, and then their modes of living became materially changed. The immense quantity of European manufactured articles which thus came into the possession of the natives induced the removal of many families to the favored region. Particularly did the Nugumiut and the Akudnirmiut migrate during that period. When in the course of time the

Bay of Nugumiut was visited by the whalers removals of members of this tribe became less frequent.

After the Eskimo had become acquainted with the advantages of firearms the natives of Davis Strait also began to trade bearskins for guns and ammunition, having learned how highly they were prized in Cumberland Sound. Besides, they received, in exchange for seals and walrus blubber put up for the whalers, tobacco, pipes, coffee, boxes, &c. In a similar way the Saumingmiut barter with the whalers of Cumberland Sound, whom they visit during the winter, carrying heavy loads of bearskins to the stations.

A brief sketch of the way in which the whaling and the trade with the Eskimo in Cumberland Sound are carried on may be of interest at this point. Two of the whaling stations are still kept up. They are situated on Qeqerten, the settlement of the Kingnaitmiut. When the Eskimo who have spent the summer inland return at the beginning of October they eagerly offer their services at the stations, for they receive in payment for a half year's work a gun, a harmonium or something of that nature, and a ration of provisions for their families, with tobacco every week. Every Saturday the women come into the house of the station, at the blowing of the horn, to receive their bread, coffee, sirup, and the precious tobacco. In return the Eskimo is expected to deliver in the kitchen of the station a piece of every seal he catches.

The time for the fall fishing commences as soon as the ice begins to form. If the weather, which is generally stormy, permits it, the boats leave the harbor to look out for the whales which pass along the east shore of the sound toward the north. During the last few years the catch has been very unprofitable, only a few whales having been seen. As the ice forms quickly the boats must be brought back about the end of October or the beginning of November. Since the whale fishery has become unprofitable the stations have followed the business of collecting seal blubber and skins, which they buy from the Eskimo. (See Appendix, Note 1.)

A lively traffic springs up as soon as the ice becomes strong enough to allow sledges to pass from shore to shore. The sledges of the stations are sent from one settlement to another to exchange tobacco, matches, coffee, bread, &c. for skins and the spare blubber which the Eskimo have carefully saved up. On the other hand, those natives who require useful articles, such as cooking pots, lamps, &c., collect quantities of hides and blubber and go to Qeqerten to supply their wants. The winter passes quickly amid the stir of business, till everything comes to a stop at the end of March, when the young sealing season fairly opens.

When the sun has reached such a height that the snow begins to melt in favored spots, a new life begins at the stations. The skins which have been collected in the winter and become frozen are

brought out of the store room and exposed to the sun's rays. Some of the women busy themselves, with their crescent shaped knives, in cutting the blubber from the skins and putting it away in casks. Others clean and salt the skins, which are likewise packed away. The men also find enough work to do after the young sealing is over, for the whale boats must be got ready for the spring fishing. Strangers whose services have been engaged by the station for the next few months arrive daily with their families and all their goods to take up their abode on Qeqerten. The boats are dug out of the deep snow, the oars and sails are looked after, the harpoons are cleaned up and sharpened, and everything is in busy preparation. The boats are made as comfortable as possible with awnings and level floors, for the crews are not to come to the shore for about six weeks.

By the beginning of May, the arrangements having been completed, the boats are put upon the sledges, which, under the direction of native drivers, are drawn by dog teams, with their crews, to the floe edge. The sledges being heavily laden and food for the dogs having to be provided by hunting, each day's stage is rather short. Arriving at the floe edge the sledges are unloaded and the boats are launched. Seals and birds of all kinds are now found in profusion and the chase is opened without delay upon everything that is useful and can be shot. Sledges are regularly sent back to Qeqerten with skins and meat for the families of the Eskimo, while the blubber is packed in casks, which are kept ready on the spot.

The most important object of the expedition is the whale. Harpoons and lines are always in readiness for the contest with the mighty monster. The boats return to the north with the breaking up of the ice and the fishing ends in July. The Eskimo are paid off and dismissed and resume their reindeer hunting, while the whites are glad to enjoy some rest after the weeks of exhausting labor.

The constant contact between the Eskimo and the whalers has effected a perfect revolution in the trade between the Eskimo tribes. As the whale catch in Cumberland Sound has fallen off during the past fifteen years, a remigration of the population of Davis Strait has occurred, ships visiting these shores every fall and a regular traffic being kept up. Therefore many Oqomiut now travel as far as Qivitung in order to trade there. As Nugumiut is still frequently visited by whalers, there is no inducement for the inhabitants to leave their country.

Within a few years the Akuliarmiut also have become amply provided with firearms and European products in general by means of a new whaling station which has been established in their vicinity.

As to the Iglulirmiut, the importation of European manufactures at Pond Bay makes the trade with that region even more important than formerly.

The Aivillirmiut and the Kinipetu have immediate intercourse

with the whalers frequenting the western shore of Hudson Bay. Besides, the southern tribes trade with the stations of the Hudson Bay Company.

The more western tribes of Boothia and its environs are dependent on the mediation of the Aivillirmiut for their supply of goods, as they themselves have no chance of communicating with the whites.

Finally, I shall describe the old trading routes which existed between these tribes before matters were totally changed by the influence of the Europeans. Two desiderata formed the principal inducement to long journeys, which sometimes lasted even several years: wood and soapstone. The shores of Davis Strait and Cumberland Sound are almost destitute of driftwood, and consequently the natives were obliged to visit distant regions to obtain that necessary material. Tudjaqdjuaq in particular was the objective point of their expeditions. Their boats took a southerly course, and, as the wood was gathered, a portion of it was immediately manufactured into boat ribs and sledge runners, which were carried back on the return journey; another portion was used for bows, though these were also made of deer's horns ingeniously lashed together. A portion of the trade in wood seems to have been in the hands of the Nugumiut, who collected it on Tudjaqdjuaq and took it north. Another necessary and important article of trade, soapstone, is manufactured into lamps and pots. It is found in a few places only, and very rarely in pieces large enough for the manufacture of the articles named. Among the places visited by the natives for the purpose of obtaining it may be mentioned Kautaq, east of Naujateling; Qeqertelung, near the former place; Qarmaqdjuin (Exeter Bay), and Committee Bay. The visitors come from every part of the country, the soapstone being dug or "traded" from the rocks by depositing some trifles in exchange. In addition to wood and soapstone, metals, which were extremely rare in old times, have formed an important object of trade. They were brought to Baffin Bay either by the Aivillirmiut, who had obtained them from the Hudson Bay Company and the Kinipetu, or by the Akuliarmiut. Even when Frobisher visited the Nugumiut in 1577 he found them in possession of some iron (Frobisher).

The occurrence of flint, which was the material for arrowheads, may have given some importance to places where it occurs. Formerly an important trade existed between the Netchillirmiut and the neighboring tribes. As the district of the former is destitute of driftwood and potstone they are compelled to buy both articles from their neighbors. In Ross's time they got the necessary wood from Ugjulik, the potstone from Aivillik. They exchanged these articles for native iron (or pyrite), which they found on the eastern shore of Boothia and which was used for striking fire. After having collected a sufficient stock of it during several years, they traveled to

the neighboring tribes. For reasons which have been mentioned this trade is now essentially changed. According to Schwatka there is a mutual distrust between the Ugjulirmiut and the Netchillirmiut on one side and the Qidnelik on the other, for which reason the intercourse between these tribes is very limited.

LIST OF THE CENTRAL ESKIMO TRIBES.

The following list gives the tribes of the Central Eskimo and their geographical distribution:

I. Northern coast of Labrador:
- (1) Kangivamiut (George River).
- (2) Kouksoarmiut (Big River).
- (3) Ungavamiut (Hope Advance Bay).
- (4) Itivimiut (Cape Wolstenholme).

II. Northern shore of Hudson Strait:
- (5) Sikosuilarmiut (King Cape).
- (6) Akuliarmiut (North Bluff).
- (7) Qaumauangmiut (Middle Savage Islands).

III. Davis Strait:
- (8) Nugumiut (Frobisher Bay).
- (9) Oqomiut (Cumberland Sound):
  - *a*. Talirpingmiut (west shore of Cumberland Sound and Nettilling).
  - *b*. Qinguamiut (head of Cumberland Sound).
  - *c*. Kingnaitmiut (Qeqerten and environs).
  - *d*. Saumingmiut (southern part of Cumberland Peninsula).
- (10) Akudnirmiut (Davis Strait).
  - *a*. Padlimiut (Padli Fjord).
  - *b*. Akudnirmiut (Home Bay).

IV. Northern part of Baffin Land, North Devon, and Ellesmere Land:
- (11) Aggomiut.
  - *a*. Tununirmiut (Eclipse Sound).
  - *b*. Tununirusirmiut (Admiralty Inlet and North Devon).
- (12) Inhabitants of Umingman Nuna (Ellesmere Land).

V. Melville Peninsula, Wager River, and Southampton Island:
- (13) *a*. Iglulirmiut (Fury and Hecla Strait).
  - *b*. Amitormiut (eastern coast of Melville Peninsula).
- (14) *a*. Pilingmiut (eastern coast of Fox Basin).
  - *b*. Sagdlirmiut (islands of Fox Basin).
- (15) Aivillirmiut (Repulse Bay and Wager River).
- (16) Sagdlirmiut (Southampton Island):

VI. (17) Kinipetu (Chesterfield Inlet).

VII. Boothia Felix and King William Land:
- (18) Sinimiut (Pelly Bay).
- (19) Netchillirmiut (Boothia Felix and King William Land).
- (20) Ugjulirmiut (King William Land and Adelaide Peninsula).
- (21) Ukusiksalirmiut (estuary of Back River).

VIII. Qidnelik (coast west of Adelaide Peninsula).

IX. Inhabitants of North Greenland.

HUNTING AND FISHING.[1]

SEAL, WALRUS, AND WHALE HUNTING.

The staple food of the Central Eskimo is the seal, particularly *Pagomys fœtidus*. The methods of hunting this animal differ materially at different seasons, as its mode of life depends on the state of the ice.

In the winter it takes to the smooth parts of the floe a few miles from the coast, where it scratches breathing holes through the ice, in which it rises to blow. It shuns hummocky ice and floes of more than one year's age. Wherever the edge of the ice is at a great distance from the settlements, the only way of procuring seals is by watching for them at these holes. For the pursuit a light harpoon is used, called unang. The shape of this weapon has been somewhat changed since the introduction of rod iron. Formerly it consisted of a shaft having at one end an ivory point firmly attached by thongs and rivets, the point tapering toward the end. The point was slanting on one side so as to form almost an oblique cone. Thus it facilitated the separation of the harpoon head from the unang. On the opposite end of the shaft another piece of ivory was attached, generally forming a knob. The material used in making the shaft was wood, bone, or ivory, according to the region in which it was manufactured. In Iglulik and in Aggo the narwhal's horn was the favorite material for the whole implement, a single horn being sufficient to make a whole shaft. Wherever wood could be procured small pieces were ingeniously lashed together. As the shaft is apt to be broken by the struggles of the animal when struck by the weapon, it was strengthened by a stout thong running along the whole length of the shaft. In all other respects the old design corresponds to the modern one. Unfortunately I have seen no specimen of this description, but a figure may be seen in Ross II, p. 272, in the hand of one of the natives. In Alaska a similar harpoon is in use, a specimen of which is represented in Fig. 390. It consists of a wooden shaft, with a stout ivory point at the lower end and another at the upper end. Both are fastened to the shaft by whalebone strings. In the upper end a slanting ivory point is inserted, which serves for attaching the harpoon head to it. The whole shaft is strengthened by a seal line, as shown in the figure.

The unang now in use in Baffin Land and on the western shore of Hudson Bay (Fig. 391) consists of a wooden shaft into which an iron rod (unartenga) is sunk. The latter is pointed at the end (see, also, Fig. 393) in about the same way as the old ivory implement. The socket is secured by a small ivory ring (unaqiuta) or a string wound around the end of the shaft. In the socket close to the iron rod

[1] A glossary of the Eskimo words used throughout this paper will be found on p. 659.

a bent nail is inserted, forming a narrow eye (tagusiarbing). Near the center of the whole implement a small piece of ivory (tikagung; see, also, Fig. 418) is fastened to the shaft, forming a support for the hand when throwing the weapon. At the lower end of the shaft a

FIG. 390. harpoon from Alaska. (American Museum of Natural History, New York.)

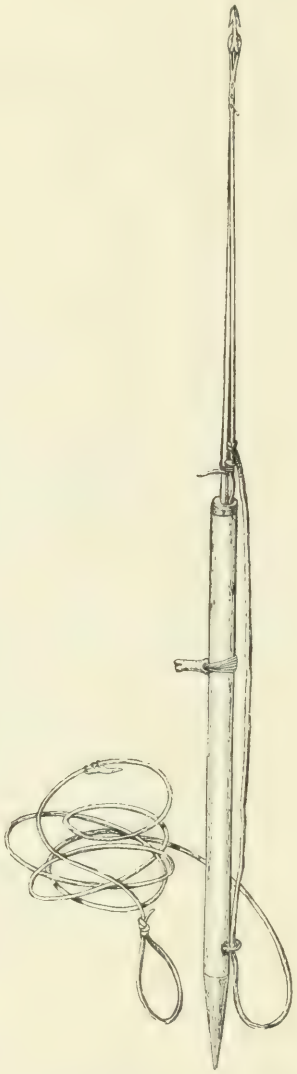


FIG. 391. Modern unang or sealing harpoon. (Museum für Völkerkunde, Berlin. IV A 6729.)

string of deer sinews or a thong is fastened, forming a loop (nabiring) which passes through a hole drilled through the shaft. A stout iron point is also attached to the lower end of the shaft (tounga).

The natives carry this implement on all their winter excursions, as it is serviceable for numerous purposes. It is always kept within reach on the sledge, as the strong iron point is useful for cutting down hummocks, should any obstruct the passage of the sledges, or for cutting holes through the ice, or it takes the place of a hatchet in breaking the frozen meat which is carried along for dogs' food. The long iron rod is extremely useful in trying the strength of the ice or the depth of the snow. By taking precautionary measures of this kind the natives pass over extensive floes of weak ice.

FIG. 392. Old style naulang or harpoon head. (Museum für Völkerkunde, Berlin. IV A 6692.) ½

The head belonging to the unang is called naulang. Since iron has been introduced in Baffin Land and Hudson Bay, the natives file their harpoon heads out of it, but adhere almost exactly to the old pattern. The old naulang was cut out of bone or more frequently out of ivory (Fig. 392). It was one inch to two inches long and had a piece of metal inserted into the slit at the top. Through the middle of the instrument a hole was drilled parallel to the plane of the blade. The harpoon line passed through the hole, and as soon as the point struck an animal and a strain was put upon the line it turned at a right angle to the latter, thus acting as a toggle. The effect was increased by two points at the lower end of the naulang, called uming (beard). These pressed into the flesh or the skin of the animal and prevented the harpoon head from slipping back.

The modern naulang (Fig. 393) is about the same length as the old one, but much more slender. While the back of the old pattern was straight, the points of the iron one are bent outward and backward in order to increase its effect.

FIG. 393. Modern naulang or harpoon head. (Museum für Völkerkunde, Berlin. IV A 6729.) ½

The naulang is fastened to the harpoon line (iparang). This part of the instrument is much longer than the unang, as it must allow for the struggles of the diving seal. The end of the line passes through the hole of the naulang and a loop is formed and secured by deer sinew or arranged as may be seen in Fig. 393. At a distance equal to the length of the iron rod of the unang a small thong (taguta) is attached to the line and serves to fasten it to the shaft (see Fig. 391). It is drawn through

the eye formed by the tagusiarbing. As soon as a strain is put upon the naulang the line parts from the shaft, as the taguta is only squeezed into the eye and is easily detached. The harpoon line passes through the nabiring or is fastened by a slipping hitch to the shaft of the unang.

If the unang has a nabiring the line passes through this loop. A few feet below it a small piece of ivory (akparaiktung) is attached to the line, acting as a hook after it has run out. It catches the nabiring and drags the harpoon along, thus impeding the movements of the animal (see Fig. 391).

a *b* *c*

FIG. 394. Qilertuang or leather strap and clasps for holding coiled up harpoon lines. *a*, *c* (National Museum, Washington. *a*, 34128; *c*, 34132.) *b* (Museum für Völkerkunde, Berlin.) ⅓

The rest of the line is coiled up and held by the hunter. The end is doubled so as to form a loop which serves as a handle when the line runs out with the diving seal. Generally, a small piece of leather (Fig. 394) with two slits at one end and an ivory clasp (qilertuang) at the other is fastened to this loop; it serves to hold the bights together when the line is detached from the harpoon and rolled up. Some art is bestowed on the manufacture of this clasp (Fig. 394). Usually it represents a seal, the head of which forms a hook on which the slits can be fastened. The clasp is either tied or otherwise secured to the leather strap. Some specimens in the British Museum, which are about one hundred and fifty years old, show that these implements have not undergone any change during that time.

Parry describes another harpoon head used by the Iglulirmiut for the unang. He calls it a siatko (Fig. 395). I myself have not seen any of a similar pattern, but Kumlien gives a sketch of one found in a grave at Exeter Sound (Fig. 396). The principal difference between the naulang and the siatko is that the edge of the former is parallel to the hole through which the line passes, while in the latter their directions are vertical to each other. The head of the whaling harpoon (see Fig. 436) acts on the same principle.

When the day begins to dawn the Eskimo prepares for the hunt. The dogs are harnessed to the sledge and the hunting implements are fitted up. The harpoon line and the snow knife are hung over the deer's antlers, which are attached to the hind part of the sledge, a seal or bear skin is lashed upon the bottom, and the spear secured under the lashing. The hunter takes up the whip and the dogs set off for the hunting ground. When near the place where he expects to find seals, the hunter stops the team and takes the implements from the sledge, which is then turned upside down. The points of the runners and the short brow antler are pressed into the snow in order to prevent the dogs from running away. A dog with a good scent is then taken from the team and the Eskimo follows his guidance until a seal's hole is found. In winter it is entirely covered with snow, but generally a very small elevation indicates the situation. The dog is led back to the sledge and the hunter examines the hole to make sure that it is still visited by the seal. Cautiously he cuts a hole through the snow covering and peeps into the excavation. If the water is covered with a new coat of ice the seal has left the hole and it would be in vain to expect its return. The hunter must look for a new hole promising better results.

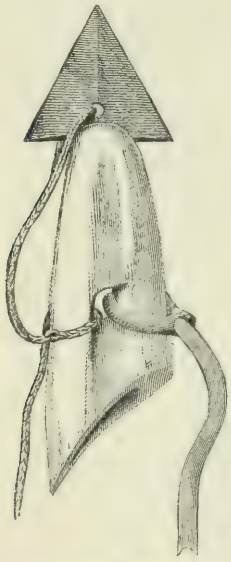


FIG. 395. Siatko or harpoon head of the Iglulirmiut. (From Parry II, p. 550.)

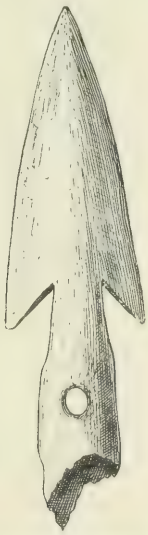


FIG. 396. Siatko found at Exeter Sound. (From a drawing by L. Kumlien.)

If he is sure that the seal has recently visited a hole he marks its exact center on the top of the snow and then fills up his peep hole with small blocks of snow. All these preparations must be made with the utmost precaution, as any change in the appearance of the snow would frighten away the seal. The Eskimo take particular

care that no hairs from their clothing fall into the hole or remain sticking in the snow, for they believe that the smell would scare away the animal. The center of the breathing hole must be marked, as the game remains invisible and only a stroke into the center will be likely to hit it. If the snow covering is very thick and strong it is cut down, but is replaced with loose snow, which is heaped around the end of the harpoon, the latter being placed upon the central point.

FIG. 397. Eskimo in the act of striking a seal. (From a photograph.)

After the harpoon has been extracted a hole remains which forms the mark for the harpooner. If the Eskimo expects the early return of the seal, he spreads a small piece of skin, generally that of a young seal, close to the hole and places his feet upon it, thus keeping them warm. He fastens the naulang to the harpoon shaft, while the lower

end of the line is folded up in a coil, which he holds in the left hand. The unang is held in both hands, and thus the hunter sometimes remains for hours, occasionally stooping and listening, until he hears the blowing of the seal. Then, all of a sudden, he stands upright, and, with all his strength, sends the harpoon straight downward into the hole, paying out the line at the same time, but keeping a firm hold of the loop at its end (Fig. 397). Generally the seal is struck near the head. If the line is fastened to the shaft by a slipping hitch it is at once detached and the harpoon either remains sticking in the snow or falls down by the hole. If the line runs through the nabiring, the harpoon is dragged into the water and impedes the movements of the animal. The hunter then begins at once to cut down the snow covering with his knife, which has been left within easy reach, and hauls in the line. As soon as the seal comes to the surface to breathe it is easily dispatched and drawn up on the ice.

The arrangements at the seal hole are more elaborate if the sealer expects to wait a long time. If only a few men go out hunting and famine is impending, he sometimes waits for a whole day or even longer, though it be cold and the wind rage over the icy fields. He builds up a semicircular wall of snow blocks to keep off the piercing wind and makes a seat in the center of it. A skin is spread under his feet and his legs are tied together with a thong, which is fastened by a peculiar kind of buckle (tutareang) with two holes (Fig. 398).

FIG. 398. Tutareang or buckle. (Museum für Völkerkunde, Berlin. IV A 6710.)

One end of the thong is firmly tied to the buckle, passing through one of the holes, while the opposite end passes tightly through the second hole. The thong may be quickly opened by a strong effort on the part of the hunter, while it helps to keep him quiet. At his right hand (Fig. 399; in this drawing it appears on the left) the snow knife is stuck into the snow, while to the left the unang is placed upon two pegs. The coil of the line lies in his lap. His left arm is drawn out of his sleeve, that he may more easily keep warm. Both sleeves are generally held together by a piece of deer's horn with a branch on each side which serves as a hook. Thus the hunter waits until he hears the breathing of the seal. As it usually stays for several minutes he is in no hurry to get ready. Cautiously he places his left arm into the sleeve, having first disengaged it from the hook.

He then takes hold of the coil, picks up his unang, and, having risen, strikes the center of the hole.

FIG. 399. Eskimo awaiting return of seal to blowhole. (From a photograph.)

Ross (II, p. 268) and Rae (I, p. 123) state that the sealing at the hole is more difficult in daylight than in the dark. I suppose, however, that when the snow is deep there is no difference; at least the Eskimo of Davis Strait never complain about being annoyed by the daylight.

Sometimes a small instrument is used in the hunt to indicate the approach of the seal. It is called qipekutang and consists of a very thin rod with a knob or a knot at one end (Parry II, p. 550, Fig. 20). It is stuck through the snow, the end passing into the water, the knob resting on the snow. As soon as the seal rises to blow, it strikes the rod, which, by its movements, warns the Eskimo. Generally it is

made of whalebone. Sometimes a string is attached to the knob and fastened by a pin to the snow, as its movements are more easily detected than those of the knob. The natives are somewhat averse to using this implement, as it frequently scares the seals.

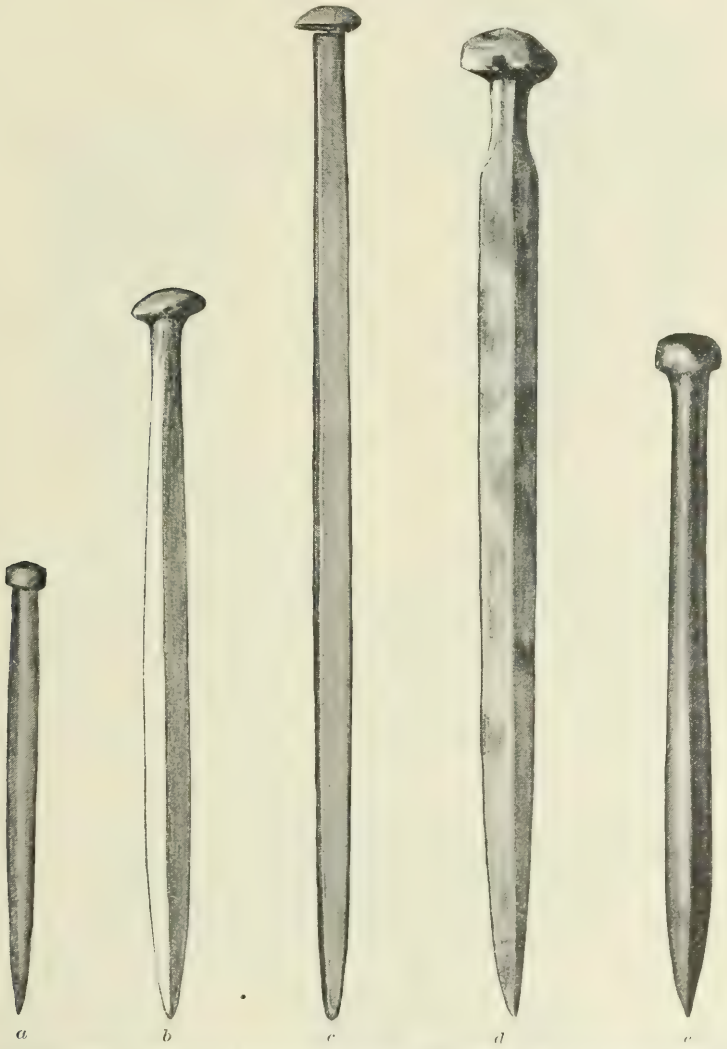


FIG. 400. Tuputang or ivory plugs for closing wounds. *c* (Museum für Völkerkunde, Berlin. IV A 6706.) *b*, *c*, *d* (National Museum, Washington. *b*, 10192; *c*, 10390; *d*, 9836.)

After the carcass of the animal has been drawn out of the water, the wounds are closed with ivory plugs (tuputang) (Fig. 400), which are carried in a wooden or leathern case (Fig. 401) and are either triangular or square. The plug is pushed under the skin, which is closely tied to its head. Another form of plug which, however, is

rarely used, is represented in Fig. 402. The skin is drawn over the plug and tied over one of the threads of the screw cut into the wood.

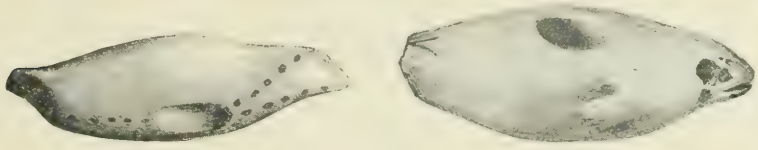
FIG. 401. Wooden case for plugs. (Museum für Völkerkunde, Berlin.) ⅓

FIG. 402. Another form of plug. (Museum für Völkerkunde, Berlin.) ⅓

After the dead animal's wounds are closed, a hole is cut through the flesh beneath the lower jaw and a thong is passed through this hole and the mouth. A small implement called qanging is used for fastening it to the seal. It usually forms a toggle and prevents the line from slipping through the hole. The patterns represented in Fig. 403 are very effective. The hole drilled through the center of the

FIG. 403. Qanging for fastening thong to jaw of seal. *a* (Museum für Völkerkunde, Berlin. IV A 6825.) *b*, *c* (National Museum, Washington. *b*, 34126; *c*, 34129.) ⅓

instrument is wider at the lower end than elsewhere, thus furnishing a rest for a knot at the end of the thong. The points are pressed into the flesh of the seal, and thus a firm hold is secured for the whole implement. The Eskimo display some art in the manufacture of this implement, and frequently give it the shape of seals and the like (Fig. 404). Fig. 405 represents a small button, which is much less



a *b*

FIG. 404. Qanging in form of a seal. (Museum für Völkerkunde, Berlin. IV A 6825.) ⅓

effective than the other patterns. A very few specimens consist merely of rude pieces of ivory with holes drilled through them. Fig. 406 shows one of these attachments serving for both toggle and handle.

FIG. 405. Qanging in form of a button. (National Museum, Washington. 34130.) ⅓

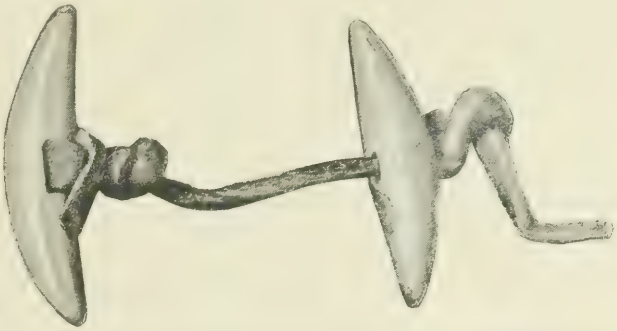
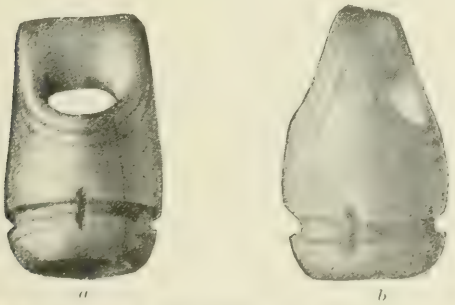


FIG. 406. Qanging serving for both toggle and handle. (National Museum, Washington. 10400.) ⅓

In order to prevent the line from getting out of order, a whirl (qidjarung) is sometimes used. Fig. 407 represents one brought



a *b*

FIG. 407. Qidjarung or whirl for harpoon line. (National Museum, Washington. 34121.) ⅓

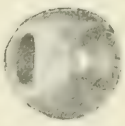


FIG. 408. Simpler form of whirl. (Museum für Völkerkunde, Berlin.) ⅓

from Cumberland Sound by Kumlien, and is described by him (p. 38). There was a ball in the hollow body of this instrument, which could not be pulled through any of the openings. One line was fastened to this ball, passing through the central hole, and another one to the top of the whirl. A simpler pattern is represented in Fig. 408.

On its capture, the seal is dragged to the sledge and after being covered with the bearskin is firmly secured by the lashing. It freezes quickly and the hunter sits down on top of it. If the seal happens to blow soon after the arrival of the hunter, a second one may be procured, but generally the day is far spent when the first seal is killed.

Wherever water holes are found they are frequently visited during the winter by the Eskimo, especially by those who have firearms. They lie in wait at the lower side of the hole, i. e., the side to which the tide sets, and when the seal blows they shoot him, securing him with the harpoon after he has drifted to the edge of the ice. These holes can only be visited at spring tides, as in the intervals a treacherous floe partly covers the opening and is not destroyed until the next spring tide.

In March, when the seal brings forth its young, the same way of hunting is continued, besides which young seals are eagerly pursued. The pregnant females make an excavation from five to ten feet in length under the snow, the diving hole being at one end. They prefer snowbanks and rough ice or the cracks and cavities of grounded ice for this purpose, and pup in these holes. The Eskimo set out on light sledges dragged by a few dogs, which quickly take up the scent of the seals. The dogs hurry at the utmost speed to the place of the hole, where they stop at once. The hunter jumps from the sledge and breaks down the roof of the excavation as quickly as possible, cutting off the retreat of the seal through its hole if he can. Generally the mother escapes, but the awkward pup is taken by surprise, or, if very young, cannot get into the water. The Eskimo draws it out by means of a hook (niksiang) and kills it by firmly stepping on the poor beast's breast. An old pattern of the hook used is represented according to Kumlien's drawing in Fig. 409; another, made from a bear's claw, in Fig. 410; the modern pattern, in Fig. 411.

Sometimes the natives try to catch the old seal in a most cruel way, by using the love of the dam for her pup to lure her to the surface of the hole. They tie a thong to the hind flipper of the pup and throw it into the hole. It dives at once, crying pitifully. When it comes up to breathe the hunter pushes it back, and frequently the dam returns to her young and attempts to draw it away. As soon as she is seen the harpoon is plunged into her body and she is quickly drawn out of the water and killed.

The young seal is also pursued by foxes, which drag it from the excavation and leave nothing but the skin, which becomes a welcome find for the Eskimo.

FIG. 409. Old pattern of hook for drawing out captured seal

FIG. 410. Seal hook of bear's claw. Actual size, 3 feet. (Museum für Völkerkunde, Berlin. IV A 6728.)

FIG. 411. Modern form of seal hook. (From a drawing by Kumlien.)

As the season advances and the rays of the sun become warmer the seals break down the snow roofs and are seen basking beside their holes. The young ones remain with their dams until late in June.

At this season a new method of hunting is practiced, by which seals are caught with greater ease than in winter. The hunter approaches

the animal from the windward side until he is within seventy or eighty yards of it. He then lies down, after having fastened a piece of skin under his left arm, upon which he reclines. The skin protects him from the melting snow, facilitates speed, and diminishes the noise as he creeps. He moves on toward the seal, resting on his left arm and side and pushing himself forward with his right foot and left arm (Fig. 413). The seal frequently raises his head and gazes around

FIG. 413. Eskimo approaching seal. (From a photograph.)

to make sure that no danger threatens. As long as the seal is looking around the hunter lies flat and keeps perfectly still, or, if he is somewhat close to the animal, imitates its movements by raising his head and rolling and playing with his hands and feet as a seal does with its flippers. Some natives will utter sounds similar to those of a blowing seal or use a small sledge with a white screen to conceal themselves from view. The sealskin clothing makes man and seal look so extremely alike that it is difficult to distinguish one from the other at some distance. If the hunter succeeds in deceiving the animal it lies down again to sleep and he pushes himself on. As the naps of the seal last but a few moments, the Eskimo approaches very slowly. At last he is near enough. He levels his gun and tries to hit the animal's head, as it must be killed by the first shot, else it jumps into the hole and escapes. If the snow is hard and water has not yet appeared on the top of the ice, a seal may be killed in this way in twenty or thirty minutes. If the snow is very soft and deep it is almost impossible to get near enough, as it is extremely difficult to push one's self along. The approach is rather easy through rough ice, which conceals the hunter, but the seals seldom frequent such places. Sometimes they are found at the edges of rough ice or near the shore and are easily caught when in this position.

Formerly the harpoon was used instead of the gun, and is even now preferred by some hunters. The hunter gets near enough to reach the seal with the harpoon, and having struck his prey has a better chance of securing it, as the weapon prevents its escape.

After the shot has been fired or the harpoon thrown, the Eskimo at once jumps to his feet in order to prevent the escape of the animal

to its hole, to which it takes if only wounded. An expert hunter can kill from ten to fifteen seals in one day.

Rae, in describing the method of hunting, states (I, p. 170) that the women at Repulse Bay are very skillful, and when they have no harpoon frequently use a small wooden club, with which they strike the seal on the nose, killing it.

Generally two men go sealing together. They set out early in the morning on one sledge, and while one creeps toward the seals the other keeps the dogs quiet. A single hunter cannot hunt successfully at this season with a sledge, for when he leaves it the dogs will either follow him or, if made fast to the ice, raise such a howling that the seal is put upon its guard. Therefore it is necessary that a continuous watch be kept on the dogs. When the shot is fired and they perceive that the seal is killed, no amount of whipping will restrain them; they rush forward until they have reached the victim, which is then lashed on the sledge.

The hunters go on in search of a second seal, at the sight of which the dogs are again stopped. When the Eskimo intend to remain out only a few hours they leave the dead animals at their holes and load them on the sledge on the return journey. A single hunter cannot leave the settlement for a long distance, but is limited to sealing near the village and killing no more animals than he can drag to it himself. Sometimes it happens that the seals are fast asleep. Then the hunter can go up to them without any precaution and kill them immediately, and even a dog team running at full speed can take them by surprise. In winter a similar method of hunting is followed whenever the edge of the floe is close to the land. In such places all kinds of seals lie on the ice, even in the midst of winter, and are pursued in the way which has been already described.

A strange method of hunting is reported by Ross (II, p. 451) as practiced by the Netchillirmiut. Eight men slowly approached the basking seal until it raised its head, when those in front stopped and shouted as loud as they could; on which three others ran up with incredible swiftness and the leader struck it with the spear.

Still later in the season, when the snow is all gone, a very successful method of hunting is practiced. All the inhabitants of the settlements set out at once, men, women, and children, and occupy every seal hole over a large area. The men keep their harpoons ready to strike the animal when it comes up to blow, while the women and children are provided with sticks only, with which they frighten away the seals whenever they rise where they are standing. The animals are compelled to rise somewhere, as otherwise they would be drowned, and thus an ample supply is secured in a short time.

After the breaking up of the ice the natives take to their kayaks and the summer hunt is started. As at this season the methods of

catching all kinds of seal and walrus are almost identical. I shall describe them together; and, first, the most important part of the hunting gear, the kayak and its belongings.

The kayak (qajaq) is almost exclusively used for hunting by all Eskimo tribes from Greenland to Alaska. According to Bessels the Ita natives do not know its use, though they have retained the word. As a connection exists between this tribe and those of Baffin Land, I have no doubt that they are acquainted with the use of the boat, though it may be of little avail in that ice encumbered region. When I first visited the tribes of Davis Strait no kayak was to be found between Cape Mercy and Cape Raper, nor had there been any for several years. In the summer of 1884, however, two boats were built by these natives.

The general principles of their construction are well known. The kayak of the Nugumiut, Oqomiut, and Akudnirmiut is bulky as compared with that of Greenland and Hudson Bay. It is from twenty-five to twenty-seven feet long and weighs from eighty to one hundred pounds, while the Iglulik boats, according to Lyon (p. 322), range from fifty to sixty pounds in weight. It may be that the Repulse Bay boats are even lighter still. According to Hall they are not heavier than twenty-five pounds (II, p. 216).

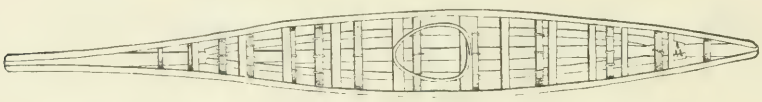


FIG. 413. Frame of a kayak or hunting boat. (Museum für Völkerkunde, Berlin.)

The frame of the kayak (Fig. 413) consists, first, of two flat pieces of wood which form the gunwale (apumang). From ten to twenty beams (ajang) keep this frame on a stretch above. The greatest width between them is a little behind the cock pit (p. 487). A strong piece of wood runs from the cross piece before the hole (masing) to the stem, and another from the cross piece abaft the hole (itirbing) to the stern (tuniqdjung). The proportion of the bow end to the stern end, measured from the center of the hole, is 4 to 3. The former has a projection measuring one-fourth of its whole length. Setting aside the projection, the hole lies in the very center of the body of the kayak. A large number of ribs (tikping), from thirty to sixty, are fastened to the gunwales and kept steady by a keel (kujang), which runs from stem to stern, and by two lateral strips of wood (siadnit), which are fastened between gunwale and keel. The stem projection (usujang), which rises gradually, begins at a strong beam (niutang) and its rib (qaning). The extreme end of the stern (aqojang) is bent upward. The bottom of the boat is partly formed by the keel, partly by the side supports. The stern projection has a keel, but in the body of the boat the side supports are bent down to the depth of the keel, thus forming a flat bottom. Rising again gradually they ter-

minate close to the stern. Between the masing and the itirbing is the hole (pa) of the kayak, the rim of which is formed by a flat piece of wood or whalebone bent into a hoop. It is flattened abaft and sharply bent at the fore part. The masing sometimes rests upon a stud.

FIG. 414. Kayak with covering of skin. (Museum für Völkerkunde, Berlin.)

The whole frame is covered with skins (aming) tightly sewed together and almost waterproof (Fig. 414). Usually the cover consists of three or four skins of *Pagomys fœtidus*. When put upon the frame it is thoroughly wetted and stretched as much as possible so as to fit tightly. It is tied by thongs to the rim of the hole. A small piece of ivory is attached to each side of the niutang and serves to fasten a thong which holds the kayak implements. Two more thongs are sewed to the skin just before the hole, another one behind it, and two smaller ones near the stern.

The differences between this boat and that of the Iglulirmiut may be seen from Lyon's description (page 320). Their kayak has a long peak at the stern, which turns somewhat upward. The rim round the hole is higher in front than at the back, whereas that of the former has the rim of an equal height all around. At Savage Islands Lyon saw the rims very neatly edged with ivory. The bow and the stern of the Iglulik kayaks were equally sharp and they had from sixty to seventy ribs. While the kayaks of the Oqomiut have only in exceptional cases two lateral supports between keel and gunwale, Lyon found in the boats of these natives seven siadnit, but no keel at all. These boats are well represented in Parry's engravings (II, pp. 271 and 508). Instead of the thongs, ivory or wooden holders are fastened abaft to prevent the weapons from slipping down.

If the drawing in Lyon's book (p. 14) be correct, the kayak of the Qaumauangmiut (Savage Islands) has a very long prow ending in a sharp peak, the proportion to the stern being 2 to 1. Its stern is much shorter and steeper than that of the northern boats and carries the same holders as that of the Iglulirmiut.

FIG. 415. Model of a Repulse Bay kayak. (National Museum, Washington. 68126.)

The model of a Repulse Bay kayak is represented in Fig. 415. The rim of the hole is in the same position as in the Iglulik kayak, the fore part resting on a rib bent like a hoop, whereas in the others

it rests on a beam. The stern resembles closely that of the Cumberland Sound boats, while the head is less peaked, the keel having a sharper bend at the beginning of the projection, which does not turn upward. Early in the spring and in the autumn, when ice is still forming, a scraper (sirmijaung) (Fig. 416) is always carried in the

FIG. 416. Sirmijaung or scraper for kayak. (Museum für Völkerkunde, Berlin.) $\frac{1}{2}$

FIG. 417. Large kayak harpoon for sea and walrus. Actual length, 6½ feet. (Museum für Völkerkunde, Berlin.)

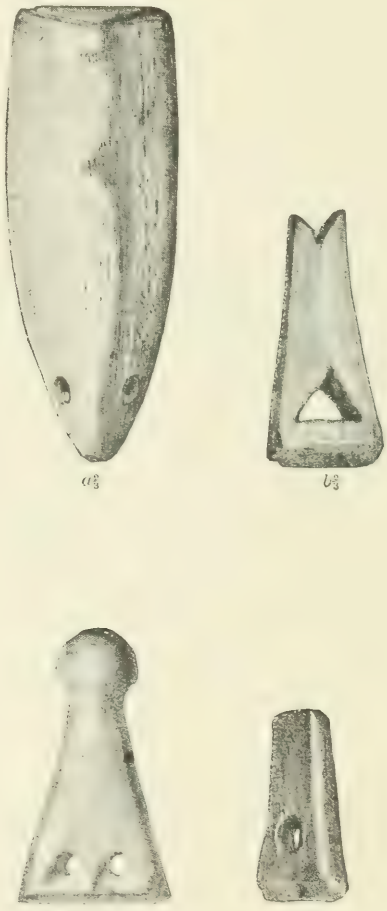


FIG. 418. Tikagung or support for the hand. *a*, *b*, *c* (National Museum, Washington. *a*, 30000; *b*, 30005; *c*, 30004.) *d* (Museum für Völkerkunde, Berlin.)

kayak for removing the sleet which forms on the skin. When the boat has been pulled on shore, it is turned upside down and the whole bottom is cleaned with this implement. A double bladed paddle (pauting) is used with the boat. It has a narrow handle (akudnang), which fits the hand of the boatman and widens to about four inches at the thin blades (maling), which are edged with ivory. Between each blade and the handle there is a ring (qudluqsiuta).

The kayak gear consists of the large harpoon and its line (to which the sealskin float is attached), the receptacle for this line, the bird spear (with its throwing board), and two lances.

FIG. 419. Qatirn or ivory head of harpoon shaft. (National Museum, Washington. 34101.)

FIG. 420. Manner of attaching the two principal parts of the harpoon.

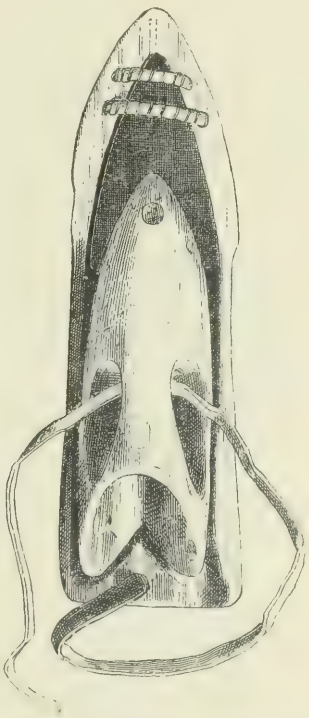


FIG. 421. Tokang or harpoon point in sheath. (In the possession of Captain John O. Spicer, Groton, Conn.)

The large harpoon (Fig. 417) is used for hunting seals and walrus from the kayak. The shaft (qijuqtenga) consists of a stout pole from four and a half to five feet in length, to which an ivory knob is fastened at the lower end. At its center of gravity a small piece of ivory (tikagung) is attached, which serves to support the hand in throwing the weapon. A remarkable pattern of this tikagung, which nicely fits the hand of the hunter, is represented in the first of the series of Fig. 418, and another one, which differs only in size from

that of the unang, in the second. At right angles to the tikagung a small ivory knob is inserted in the shaft and serves to hold the harpoon line. At this part the shaft is greatly flattened and the cross section becomes oblong or rhombic. At the top it is tenoned, to be inserted into the mortice of the ivory head (qatirn). The latter fits so closely on the tenon that it sticks without being either riveted or tied together. The qatirn is represented in Fig. 419. Into the cavity at its top a walrus tusk is inserted and forms with it a ball and socket joint (igimang).

The tusk and the qatirn are fastened to each other in a most ingenious way, which may be readily made out from the engraving (Fig. 420). The principal effect of this arrangement of the holes and the thong is that the tusk is kept steady by two parallel thongs that prevent it from tipping over and only allow a movement in the plane of the flattening of the shaft as soon as any considerable force is applied to the tusk.

The harpoon head used in connection with this weapon is the tokang. To prevent it from being injured, it is carried in a wooden sheath (Fig. 421). The iron point is secured by a string of whalebone or sealskin; the lower part is fastened to the sheath as indicated in the figure. The tokang differs from the naulang in that it is larger and stouter. In some cases great care is bestowed upon the finishing of this important weapon.

Fig. 422. Tokang or harpoon head taken from a whale in Cumberland Sound. (National Museum, Washington. 34069.)

An interesting specimen of this variety of harpoon head was found by Kumlien in Cumberland Sound (Fig. 422). It was taken from a whale and differs from the device of that country. The back is bent similar to that of the iron naulang and the barbs have two points each instead of one. The front part is sharply ridged. The specimen is very nicely finished. A few very old harpoon heads of the same pattern are deposited in the British Museum and were of Hudson Strait manufacture; therefore I conclude that Kumlien's specimen is from the same part of the country.

Fig. 423 represents an ancient harpoon head of the same style, the locality of which is unfortunately unknown. The specimen is of particular interest, as it shows the method of fastening the stone to the ivory part. A similar specimen is in the collections of the British Museum; it formed part of the Sloane collection. Both these specimens show perforations at the lower end of the harpoon head which

are not found in the modern ones. Probably these served for holding the harpoon head to the shaft by means of a thin line, in order to prevent the head from coming off before the seal or walrus was struck. These holes are similar to the ones shown in Figs. 395 and 436.

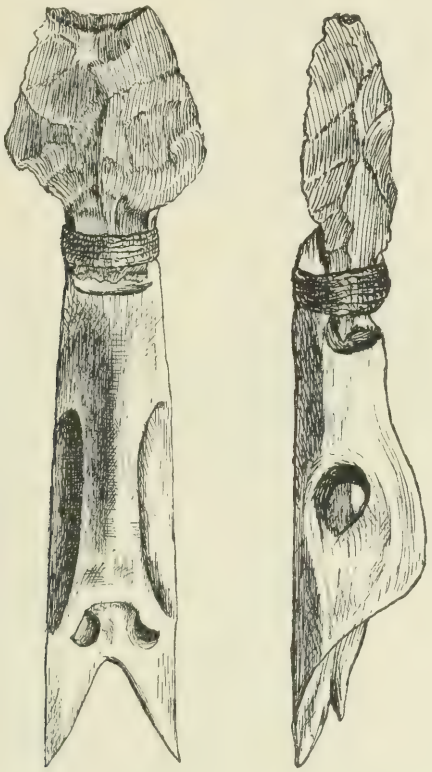


FIG. 423. Ancient tokang or harpoon head. (In A. Sturgis's collection, New York.)

The harpoon line (alirn) is attached to the tokang in the same way as the iparang is to the naulang. When it is fastened to the igimang, the bend of the tusk facilitates the disengagement of the harpoon head, which turns its back to that of the tusk. Attached to the line at the level of the ivory knob which has been mentioned is the teliqbing (Fig. 424), into the hole of which the knob fits closely. As the line from the tokang to the teliqbing is just long enough to allow it to be pulled down far enough to reach the knob, it holds shaft and head firmly together so long as the tusk remains in its position. As soon as a lateral strain is put upon the tusk the distance between the head and the knob is diminished and the teliqbing slips off, thus disengaging the line with the harpoon head from the shaft. Sometimes the teliqbing has two holes, one being used when the line is wet and longer, the other when it is dry and shorter.

In Iglulik the spear is called qatilik (Fig. 425). In pattern it is the same as that of Akudnirn and Oqo, the only difference, accord-

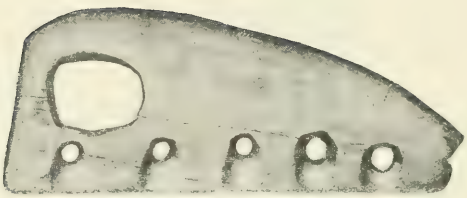


Fig. 424. Teliqbing, which is fastened to harpoon line. National Museum, Washington. 24123.) $\frac{1}{4}$

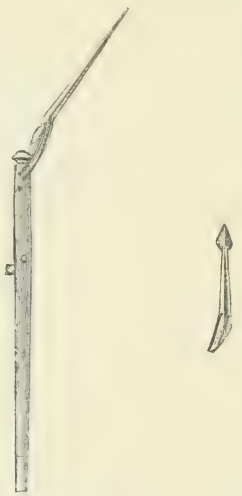


Fig. 425. Qatilik or spear from Iglulik (From Parry II, p. 550.)

ing to Parry's description, being that the toung (the tusk) is straight and has a notch near its socket (see Fig. 425), while the harpoon head which belongs to it has only a single point at its lower end.

Fig. 426. Avautang or sealskin float. (National Museum, Washington. 30009.)

This harpoon is placed on the right side of the prow of the kayak, with the point directed towards its head. The harpoon line, with the tokang, lies just before the hunter in a flat receptacle (asedlun), which consists of a wooden ring with a handle, held by thongs before the hole of the kayak. The receptacle rests on the skin cover, having no feet, as has the Greenland one. In Hudson Strait it is secured upon holders. The harpoon line is rolled up in a coil, but its end is fastened to the seal float, which lies behind the hunter and is held in place by a thong. The line passes along the right side of the kayak hole. The float (avautang) (Fig. 426) consists of a whole sealskin which had been removed from the animal dexterously, its

entire body being pulled through the mouth, which is enlarged by means of a cut along the throat. The nails of the flippers are frequently extracted and the openings sewed up, the hind flippers and the tail being cut off and firmly tied together by a thong, thus forming a neck (atauta), to which the harpoon line is attached. At the head a pipe for blowing up the skin (poviutang) is inserted (Fig. 427); the skin is firmly tied to the ring of the pipe, on which the stopper is secured as soon as the skin is sufficiently inflated. This device is a very convenient one, for it is difficult to inflate the skin without some kind of mouthpiece. If there are any holes in the float they are closed by a button similar to the one shown in Fig. 427 *a*, which, however, is without a hole.

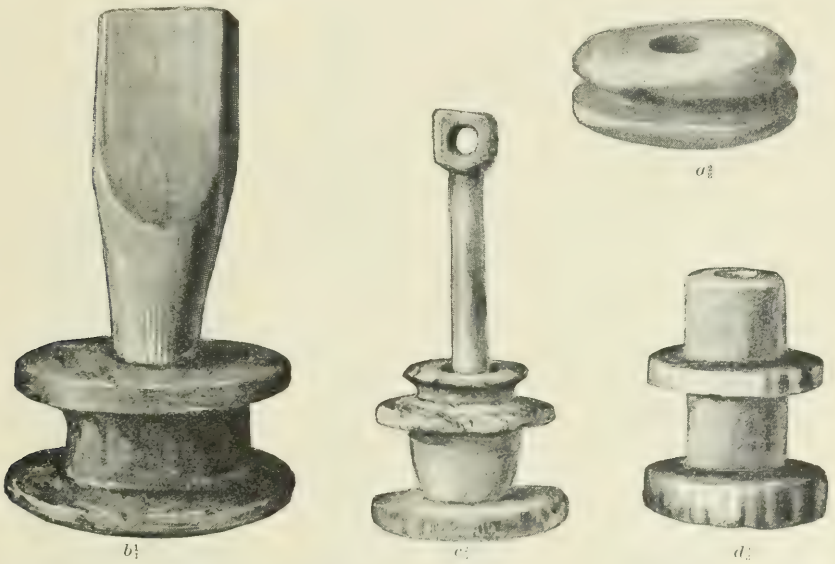


FIG. 427. Different styles of poviutang or pipe for inflating the float. (National Museum, Washington. *a*, 29986; *b*, 34118; *c*, 34119; *d*, 34120.)

If the harpoon is to be used for hunting large animals, such as walrus or whales, a very ingenious contrivance is sometimes inserted between the line and the float in the shape of a wooden hoop with a seal or deer skin stretched over it (niutang) (see Fig. 437). Three or four thongs of equal length are fastened to the hoop at equal distances and bound together. At their point of union they are attached to the line. As soon as a walrus is struck and starts to swim away, the hoop is thrown at right angles to the stretched line and exerts a strong resistance when dragged along, thus diminishing the speed of the animal and quickly exhausting its strength. The float prevents its escape, as it is too buoyant to be drawn under water. The animal cannot dive, and thus the hunter does not lose sight of his prey.

For small seals a similar weapon is used, the agdliaq (Fig. 428),

the main difference being that it is much smaller and has a seal bladder for a float attached to the shaft. I have not seen this weapon myself, but Kumlien has brought away parts of it. Fig. 429 shows that its point differs only in size from the large igimang. The head (probably the naulang) is tied to the shaft, which acts as a drag.

The points are fastened to the shaft in almost the same way as the former, the only difference being that they are straight; the drill holes do not cross one another. Fig. 430 represents the heads belonging to this spear; Fig. 431, a large one which is used with the large harpoon. As the lines in all these run as is represented in Fig. 429 *b*, they cannot act as harpoons. I had no opportunity of seeing any of these weapons myself.

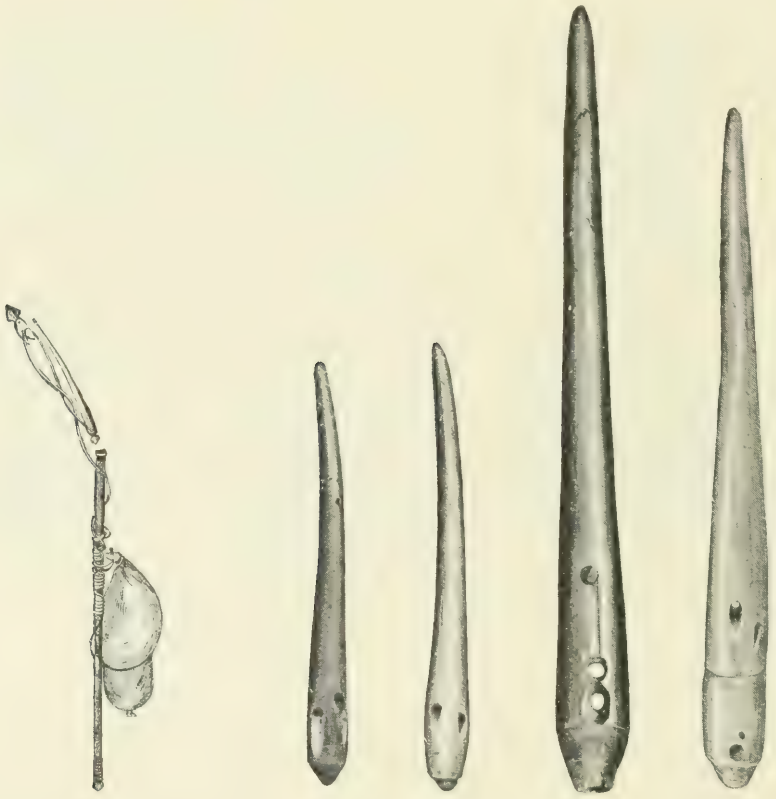


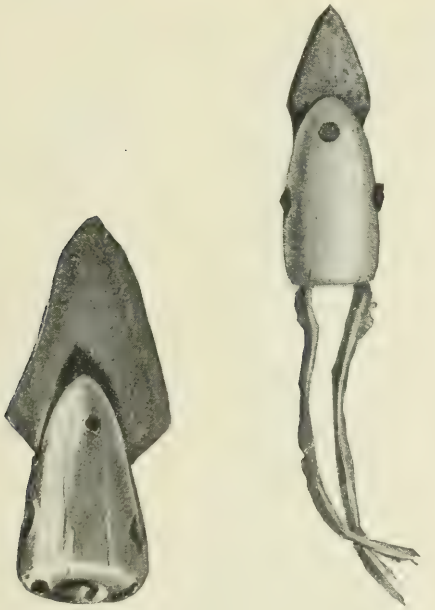
FIG. 428. Agdliaq or spear for small seals. (From Parry II, p. 550.)

FIG. 429. Agdliaq points. (National Museum, Washington. *a*, 90165; *b*, 2991; *c*, 34098; *d*, 34063.)

In hunting walrus a lance (anguvigang) (Fig. 432) is used which is similar to the igimang. The shaft and the joint are alike in both, only the knob for the teliqbing being absent. The head is made of bone or the straight part of a walrus tusk and has an iron

blade on the top. The lance serves to dispatch the animal after it has been harpooned with the igimang.

The joint prevents the shaft from being broken by the struggles of the animal. Its place is behind the hunter on the right side of the kayak, the point being directed toward the stern. Generally a second lance is carried on the left side of the boat parallel with the other. It is either of the same kind or a slender shaft with a long point firmly inserted in it (kapun, ipun). The point is about one and one-third of a foot to one and one-half feet long. This weapon, however, is more particularly in use for hunting deer in the lakes and ponds.



$a\frac{1}{4}$ $b\frac{1}{4}$

FIG. 430. Spear heads. (National Museum, Washington. *a*, 34076; *b*, 34068.)

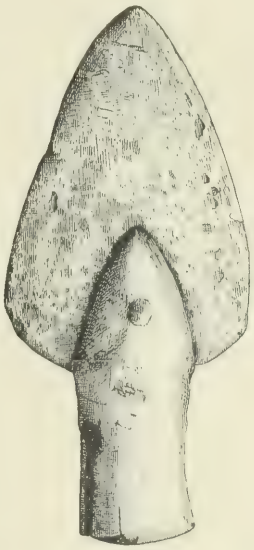


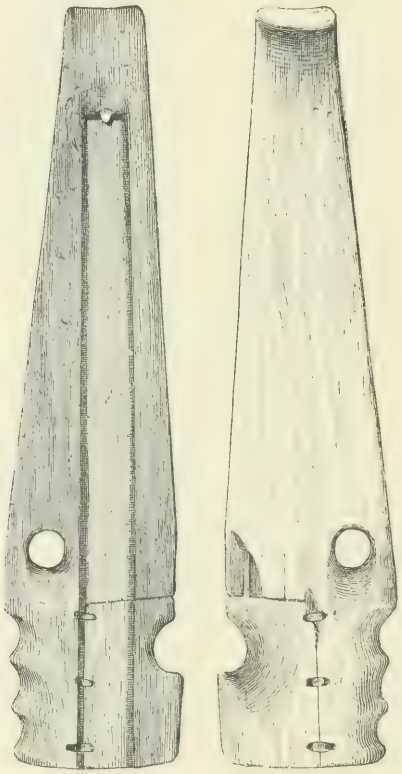
FIG. 431. Large spear head. (National Museum, Washington. 10136.) $\frac{1}{4}$

The last implement in the kayak gear to be described is the bird spear, nuirn (Fig. 433), with its throwing board, nuqsang (Fig. 434). It has a shaft of about four feet in length, flattened at the lower end. Among the natives on the east and southeast of Baffin Land it has an iron prong at its point, whereas in Iglulik it has two points of unequal length, with double barbs. Three double barbed prongs are attached to the center of the shaft. They have a sharp bend at their lower part, the points running parallel to the shaft. The prongs of the Greenland dart are straight and diverge from the shaft. The lower end of the bird spear fits into the groove of the throwing board. Therefore the end of the shaft is squared. The ivory knob at the end of the spear contains a small hole for the insertion of the

spike which is in the end of the groove. When the board is used it is held firmly in the right hand, the first finger passing through the hole by the side of the groove, the thumb clasping the notch on the left side (Fig. 434 *b*), the other fingers those on the right side. The shaft is held by the points of the fingers. When the spear is hurled

FIG. 432. Anguvigang or lance. (Museum für Völkerkunde, Berlin.

FIG. 433. Nuirn or bird spear. (Museum für Völkerkunde, Berlin.)



a *b*

FIG. 434. Nuqsang or throwing board, *a* front and *b* back view. National Museum, Washington. 30013.

the posterior point of the groove describes a wide circle and the fingers let go the shaft, which, remaining in its first position, is driven forward by the spike with great violence, and thus it attains considerable velocity.

I will now give a description of the methods of hunting seals and walrus during the summer. As long as ice cakes are drifting in the bays the natives do not use their seal floats, which would be severed from the line and easily torn to pieces. They paddle to a small cake, on which they lift their kayaks, and cautiously move the cake towards another one on which a seal or walrus is asleep. After they have come within range of their game they shoot it. As an abundance of all kinds of seals and walrus are basking on the ice plenty of food can be obtained.

An ingenious way of walrusing during this season is described by Lyon (p. 330):

> When the hunters, in their canoes, perceive a large herd sleeping on the floating ice, as is their custom, they paddle to some other piece near them, which is small enough to be moved. On this they lift their canoes, and then bore several holes, through which they fasten their tough lines, and when everything is ready, they silently paddle the hummock towards their prey, each man sitting by his own line and spear. In this manner they reach the ice on which the walruses are lying snoring; and if they please, each man may strike an animal, though, in general, two persons attack the same beast. The wounded and startled walrus rolls instantly to the water, but the siatko, or harpoon, being well fixed, he cannot escape from the hummock on which the Eskimo have fastened the line. When the animal becomes a little weary, the hunter launches his canoe, and lying out of his reach, spears him to death.

When the ice is gone seals are shot or harpooned with the igimang and the agdliaq. The float prevents their escape and they are killed with the anguvigang or the qapun. Later in summer, when they begin to shed their fur, they lose almost all their blubber and sink when shot; therefore they must be hunted with the harpoon and the float. As the walrus is a dangerous foe should it turn upon the hunters in their light boats, the harpoon is thrown from a great distance, and the animal is not attacked at close quarters until it is well nigh exhausted by dragging the float and the niutang and by loss of blood. A great number of walrus are shot or harpooned while basking on the low islands and rocks.

There are a few shoals and narrow inlets in Frobisher Bay and Cumberland Sound in which great numbers of seals are caught during the summer. In hunting them at those places some of the Eskimo in kayaks occupy the shallow entrance of the inlet, while others scare the seals from its head. As the seals approach its outlet they are speared by those who are lying in wait for them. Since the natives have procured firearms seals are shot from the boats, and in whale boats they even attack the walrus, though they prefer to have drifting ice near at hand in case the fierce animal should turn upon them and tear the boat with its powerful tusks. This method of hunting is very successful in openings which intersect the land floe in spring. To these places an enormous number of seals and walrus

resort, and they are shot either when basking at the edge of the water or when blowing.

In the fall, when the small bays are covered with ice and newly formed floes drift to and fro in the open sea, the natives go sealing at the edge of the land ice (Fig. 435). The seals are shot on the drifting ice or in the water and are secured by means of the unang, in the following manner: The hunter jumps upon a small cake, which he pushes on with his spear until he is near the body of the animal, and then drags it upon the land floe with the harpoon line. This method is almost the same as the one used in sealing and walrusing during the winter wherever the open water is close to the shore.

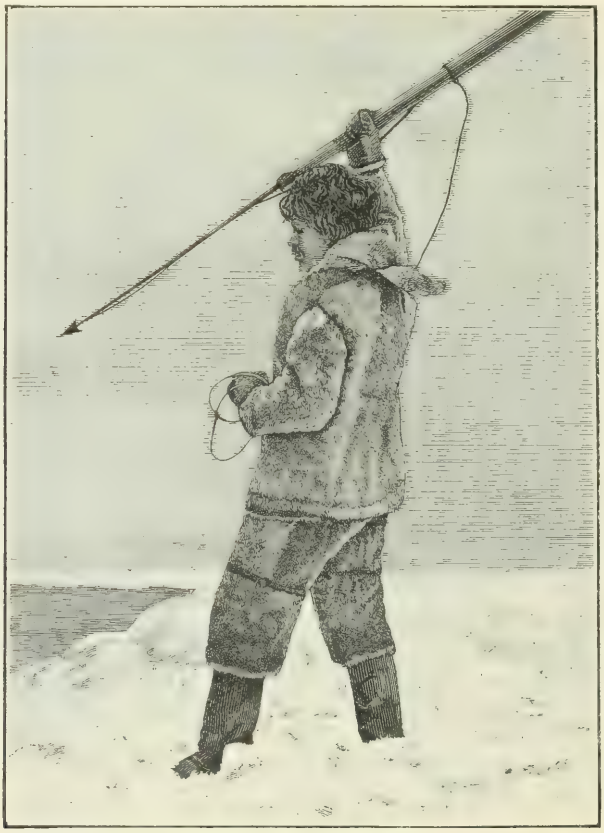


FIG. 435. Sealing at the edge of the ice. (From a photograph.

This hunt is described by Gilder in the following words (pp. 182–184):

Usually there are two hunters who approach the walrus, one hiding behind the other, so that the two appear but as one. When the spear is thrown, both hold on to the line, which is wound around their arms so as to cause as much friction as possible.

in order to exhaust the animal speedily. * * * When the line is nearly run out the end of the spear shaft is passed through a loop in the end of the line and held firmly by digging a little hole in the ice for the end of the spear to rest in, the foot resting upon the line and against the spear to steady it. This gives the hunter an immense advantage over his powerful game, and if he is fortunate enough to secure this hold there is no escape for the walrus except that the line may cut on the edge of the sharp ice, or the thin ice break off, and hunter, line, and all be precipitated into the water—a not unusual experience in walrus hunting. Another cause of misfortune is for the line to become entangled around the arm of the hunter so that he cannot cast it off, in which case he is most assuredly drawn into the sea, and in nine cases out of ten drowned, for his knife is seldom at hand for an emergency and no amount of experience will ever induce an Inung [Eskimo] to provide against danger.

Sometimes the hunter is alone when he strikes a walrus, and in that case it requires considerable dexterity to secure the spear hold in the ice; or if he fails to get that he may sit down and brace his feet against a small hummock, when it comes to a sheer contest of muscle between the hunter and the walrus. In these contests victory generally perches upon the banner of the walrus, though the Inung [Eskimo] will never give up until the last extremity is reached. Often he is dragged to the very edge of the ice before he finds a protuberance against which to brace his feet, and often he is drawn down under the ice before he will relinquish his hold. He is very tenacious under such circumstances, for he knows that when he loses the walrus he loses his line and harpoon also.

Hall (I, p. 459) describes the hunt, according to his observations in Frobisher Bay, as follows:

The line is coiled, and hung about the neck of the hunter; thus prepared he hides himself among the broken drifting ice, and awaits the moment for striking his game. The spear is then thrown and the hunter at once slips the coil of line off his head, fastens the end to the ice by driving a spear through a loop in it, and waits till the walrus comes to the surface of the water, into which he has plunged on feeling the stroke of the harpoon; then the animal is quickly despatched by the use of a long lance.

Sometimes the walrus when swimming under an extensive floe of new ice are drowned by being frightened down every time they try to come up to blow.

Formerly whaling was one of the favorite hunts of the Central Eskimo and in some places it is even continued to this day. Whales are either pursued in kayaks or in skin boats. If the kayak is used, they are harpooned in the same way as the walrus, a very large float (avautapāq′) being attached to the harpoon head. The whale is pursued by a great number of kayaks and every boatman endeavors to drive his harpoon into the animal, which, by the loss of blood and the resistance of the niutang and floats, is tired out and killed with lances.

More frequently it is pursued in skin boats (p. 527), which for the purpose are propelled by means of paddles (angun). In this case the crew consists entirely of men, although on other occasions the rowing falls to the women's share; a skillful boatman steers the boat and the harpooner stands in the bow watching his opportunity to strike the whale. The implement used in this pursuit is represented in Fig. 436. I could not procure the weapon itself (sakurpāng′, i. e., the

largest weapon), but had a model made by an Akudnirmio, of which the figure is a drawing. The shaft is said to be very long and heavy, measuring from ten to twelve feet. To this shaft a bone point tapering towards the end is firmly attached. The harpoon head consists of two pieces similar to the siatko of the Iglulirmiut (see Fig. 395). The iron edge is inserted into a flat piece of bone, which fits into the slit of a large head. The latter is made from the jawbone of a whale and is extremely heavy. When the whale is struck, both parts, the head and the edge, are disengaged from the shaft and separated from each other, but both enter the flesh of the whale and work in the same way as the tokang.

Fig. 436. Model of sakurpāng' or whaling harpoon.

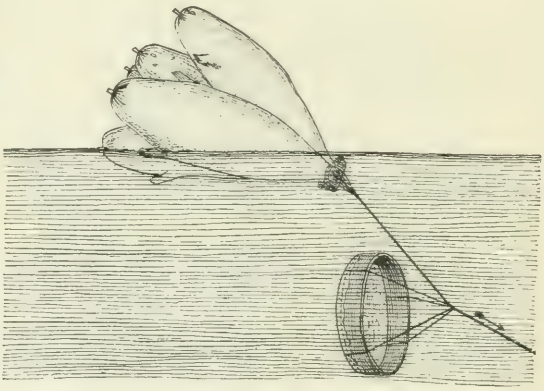


Fig. 437. Niutang, with floats.

The long harpoon line is coiled up on the first thwart of the boat. On the second one the niutang and five large floats (Fig. 437), which were fastened to the line, are kept ready and heaved overboard as soon as the harpoon is fast to a whale. The buoys and the niutang tire it out quickly and the boat can easily follow it up. It is lanced with the kalugiang whenever it comes up to blow. This lance consists of a heavy handle with a long point of rod iron; formerly bone or narwhal ivory, with an iron edge inserted into its point, was used for this purpose.

The narwhal and the white whale are hunted in the same way as the walrus and the right whale. There are a few shallow bays to which the white whale resorts in the summer. If a shoal of them has entered such a bay, the Eskimo take to their boats and kayaks, and by throwing stones frighten them into the shallowest part, where they are easily harpooned.

DEER, MUSK OX, AND BEAR HUNTING

When the snow has melted and the short summer is at hand the Eskimo start for the deer hunt. The tribes possessed of firearms can easily procure deer all the year round, particularly where uneven land facilitates their approach toward the herd; but in summer the hunt is most important, as it is the only season in which deerskins are fit for clothing.

The favorite method of hunting is to attack the deer in the ponds when swimming from one side to the other. In many places the deer in their migrations are in the habit of crossing the narrow parts of lakes, and here the natives lie in ambush with their kayaks. In other places they are driven into the water by the Eskimo and attacked by the drivers or by hunters stationed on the lake. Favorite places for such a chase are narrow peninsulas, generally called nedlung. The Eskimo deploy into a skirmish line and slowly drive the herd to the point of the peninsula, whence the deer, the retreat being cut off, take to the water.

If the shore be too straight to permit this method of hunting, they drive the deer to a hill stretching to the lake. A line of cairns (inugsung) is erected on the top, intended to deceive the deer, which believe them a new line of hunters approaching from the opposite side. They take to the water, as they see no retreat. If there are no hills a line of cairns is erected in some part of the plain. Such monuments are found all over the country, most of them having the appearance of being very old.

As soon as the deer are in the water the natives pursue them in their kayaks, and as their boats are propelled much more swiftly than the animals can swim they are quickly overtaken and killed with the spear (kapun). Sometimes the wounded deer will turn upon the boat, in which cases the hunter must make his escape with the utmost speed, else he will be capsized or the skin of the boat will be torn to pieces by the animal's antlers.

In some of the narrow valleys with steep faces on both sides the deer are driven toward the hunters. As there is no chance for escape on either side they are killed by the men who lie in ambush. A remarkable tradition referring to the deer hunts of a fabulous tribe in these passes is frequently told by the Eskimo (see p. 635).

Some places are particularly favorable to these methods of hunt-

ing. The herds when traveling north in spring and south in autumn take the same course every year, passing rivers, lakes, and valleys at the deer passes. Here the Eskimo stay during the migrations of the deer, as they are sure to fall in with them and to secure plenty of meat and skins during the season. In spring the rivers and lakes are not yet freed from their icy fetters and the pursuit is more difficult; in the autumn, however, they are easily captured in the water. Some important stations of this kind are the island Qeqertome itoq tudlirn, south of Lake Nettilling; the outlet of this lake, Koukdjuaq, particularly the peninsula formed by the river and the south shore of the lake; the country about Qudjitariaq, farther north, and the narrow valley between Piling and Itirbilung : on the continent, the lakes of Rae Isthmus, particularly North Pole Lake; some passes in the hills north of Chesterfield Inlet; the isthmus of Boothia; the entrance of Qimuqsuq, on Adelaide Peninsula; and Simpson Strait.

Referring to the last, Klutschak describes an interesting method of hunting deer which is in vogue in that locality (p. 130). The narrow strait which separates Ita Island from King William Land freezes up early in the season, and the reindeer in trying to cross the strait frequently gather on this island. The Eskimo deploy over the icy bridge and make a terrible noise, frightening the reindeer, which are gradually driven toward a place the ice of which is treacherous at this time of the year. Here they break through and, being able to move only with great difficulty, are easily killed.

Fig. 438. Wooden bow from Iglulik. (From Parry II, p. 550.)

When the deer have scattered over the country they must be stalked, and, wherever the natives have no firearms, bows and arrows are used.

Fig. 439. Wooden bow from Cumberland Sound. (National Museum, Washington.)

They have two kinds of bows (pitiqse) : a wooden one (Figs. 438 and 439) and another made of reindeer antlers (Figs. 440 and 441). Parry gives a very good description of the former (II, p. 510) :

One of the best of their bows was made of a single piece of fir, four feet eight inches in length, flat on the inner side and rounded on the outer, being five inches in girth about the middle where, however, it is strengthened on the concave side, when strung, by a piece of bone ten inches long, firmly secured by tree-nails of the same material. At each end of the bow is a knob of bone, or sometimes of wood covered with leather, with a deep notch for the reception of the string. The only wood which they can procure, not possessing sufficient elasticity combined with

strength, they ingeniously remedy the defect by securing to the back of the bow, and to the knobs at each end, a quantity of small lines, each composed of a plat or "sinnet" of three sinews. The number of lines thus reaching from end to end is generally about thirty; but besides these, several others are fastened with hitches round the bow, in pairs, commencing eight inches from one end, and again united at the same distance from the other, making the whole number of strings in the middle of the bow sometimes amount to sixty. These being put on with the bow somewhat bent the contrary way, produce a spring so strong as to require considerable force as well as knack in stringing it, and giving the requisite velocity to the arrow. The bow is completed by a woolding round the middle and a wedge or two here and there, driven in to tighten it.

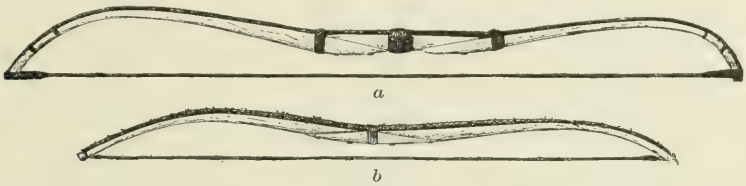


FIG. 440. Bows of reindeer antlers. (National Museum, Washington. *a*, 34053; *b*, 34055.)

The bow represented in Fig. 439 is from Cumberland Sound and resembles the Iglulik pattern. The fastening of the sinew lines is different and the piece of bone giving additional strength to the central part is wanting. In Cumberland Sound and farther south wooden bows each made of a single piece were not very rare; the wood necessary for their manufacture was found in abundance on Tudjan (Resolution Island), whence it was brought to the more northern districts.

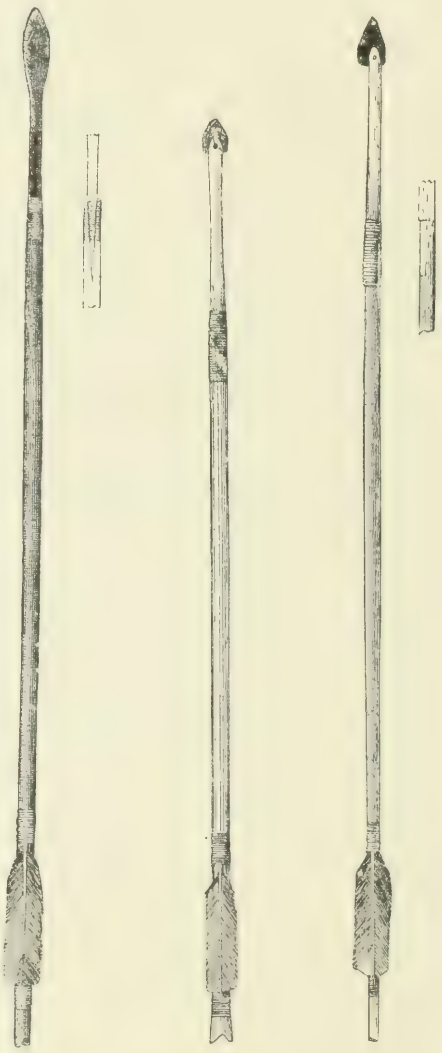
FIG. 441. Bow of antlers, with central part cut off straight, from Pelly Bay. (National Museum, Washington. 10270.

The bows which are made of antlers generally consist of three pieces, a stout central one slanted on both sides and two side pieces riveted to it. The central part is either below or above the side ones, as represented in Fig. 440. These bows are strengthened by plaited sinews in the same way as the wooden ones and generally the joints are secured by strong strings wound around them. A remarkable bow made of antlers is represented in Fig. 441. The central part is not slanted, but cut off straight. The joint is effected by two additional pieces on each side, a short stout one outside, a long thin one inside. These are firmly tied together with sinews. The short piece prevents the parts from breaking apart, the long one gives a powerful spring. The specimen here represented was brought home by Hall from the Sinimiut of Pelly Bay, and a similar one was brought by Collinson from Victoria Land and has been deposited in the British Museum. The strings are attached to these bows in the same way as to the wooden ones.

The arrows (qaqdjung) are made of round pieces of wood generally tapering a little towards the lower end, to which two feathers of an owl or some other bird are attached. The bone heads of these

a *b*½

FIG. 442. Arrows with bone heads. (National Museum, Washington. *a*, 34054; *b*, 10270.)



*a*¾ *b*½ *c*

FIG. 443. Arrows with metal heads. *a*, *b* (National Museum, Washington. *a*, 30056; *b*, 34056.) *c* (Museum für Völkerkunde, Berlin. IV A 6705.)

arrows are joined to the shaft as represented in Fig. 442, while metal heads are inserted as shown in Fig. 443. The difference in the methods used by the Mackenzie and the central tribes in fastening

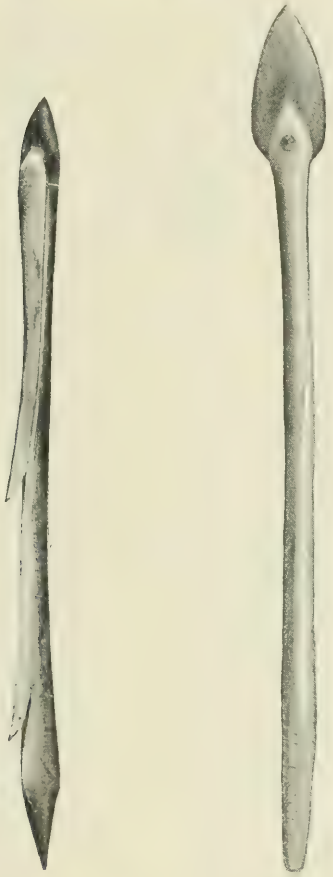
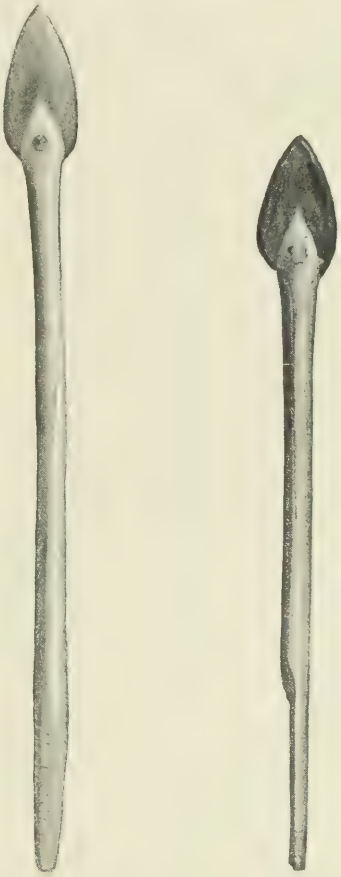


FIG. 444. Arrowhead from Boothia. (National Museum, Washington. 10205.) ½



a b

FIG. 445. Showing attachment of arrowhead vertically and parallel to shank. (National Museum, Washington. *b*, 10137.) ½

the point to the shaft is very striking. The arrow point of the former and of the western tribes is pointed and inserted in the shaft (Fig. 444),[1] while that of the latter is always slanted and lashed to it (Figs. 442 and 443). The direction of the slant is either parallel or vertical to the edge (Fig. 445). Other forms of arrows are shown in Fig. 446. A similar difference between the fastenings of the socket to the spear handle exists in the two localities. The western tribes give its base the form of a wedge (Fig. 447), which is inserted in the shaft, while the Central Eskimo use a mortise.

[1] According to the Museum catalogue, the point represented in this figure is from Victoria Island, Boothia, from Hall's collection; however, it is a typical western arrow.

Formerly slate heads were in general use (Fig. 448); now the heads are almost everywhere made of iron or tin, riveted or tied to the

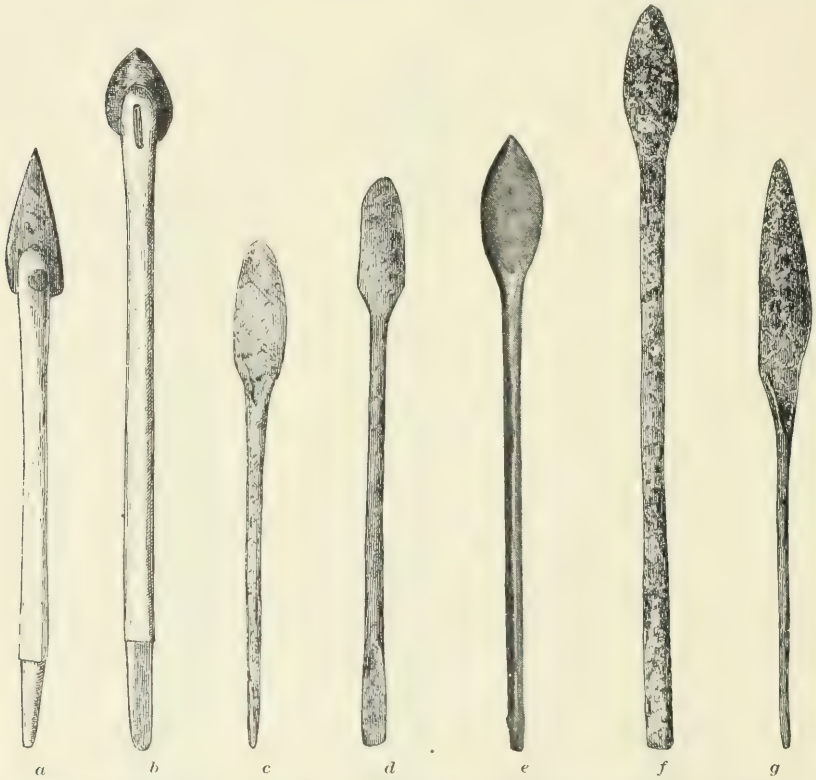


FIG. 446. Various forms of arrowhead. (National Museum, Washington. *a*, 29993; *c*, 10213.) ½

FIG. 447. Socket of spear handle from Alaska. (National Museum, Washington. 36060.) ½

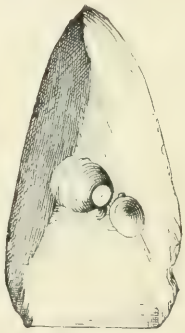
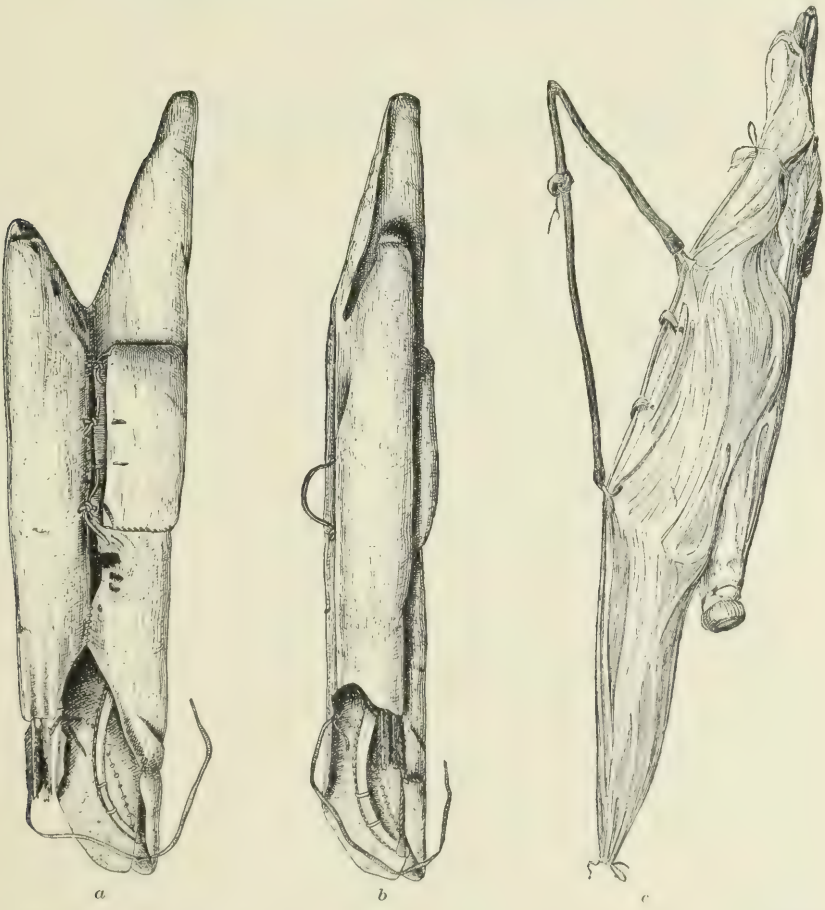


FIG. 448. Slate arrowhead. (National Museum, Washington. 10403.) ½

a *b* *c* *d* *e*

FIG. 449. Flint arrowheads from old graves. (National Museum, Washington. *c*, 30109; *d*, 34138.) ½

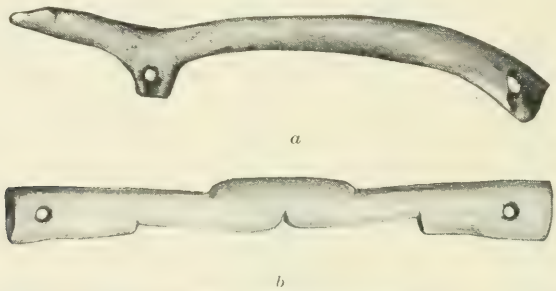


a *b* *c*

FIG. 450. Various styles of quiver. *a*, *b* Two views of a quiver from Cumberland Sound. (National Museum, Washington. 30015.) *c* Quiver from Iglulik (from Parry II, p. 550)

point (Fig. 446). In ancient graves flint heads are frequently found, some of which are represented in Fig. 449. On Southampton Island stone heads are in use even at the present time. Fig. 423 probably shows how they were attached to the shank.

The quiver (Fig. 450) is made of sealskin, the hair of which is removed. It comprises three divisions, a larger one containing the bow and a smaller one containing four or six arrows, the head directed toward the lower end of the case. When extracted from the quiver they are ready for use. Between the two compartments there is also a small pouch, in which tools and extra arrowheads are carried.



a

b

FIG. 451. Quiver handles. (Museum für Völkerkunde, Berlin. *a*, *b*, IV A 6843.)

When traveling the Eskimo carry the quiver by an ivory handle; when in use it is hung over the left shoulder. Fig. 451 represents quiver handles, the first being fashioned in imitation of an ermine.

If the deer cannot be driven into the water the Eskimo either stalk them or shoot them from a stand. In a plain where the hunter cannot hide himself it is easier to approach the herd if two men hunt together. They advance, the second man hiding behind the first one by stooping a little. The bows or the guns are carried on the shoulders so as to resemble the antlers of a deer. The men imitate their grunting and approach slowly, now stopping and stooping, now advancing. If the deer look about suspiciously they sit down, the second man lying almost flat on the ground, and both, at some distance off, greatly resemble the animals themselves. Ross (II, p. 252) states that the inhabitants of Boothia imitate the appearance of the deer, the foremost of two men stalking a herd bearing a deer's head upon his own.

It is somewhat difficult to approach the deer near enough to get within range, especially if they are hunted with bow and arrow. Generally it is not necessary to get quite near them, for when feeding the herd moves on in the same direction for some time, and the hunter can hide behind a stone lying in that direction and wait until they are within range. After the first shot has been fired they do not take to flight at once, but stand for a few seconds, struck with sur-

prise, and a clever hunter may kill two or three before they run away. If the country is very level the Eskimo raise heaps of stones or build circular or semicircular walls to conceal themselves and allure the animals by grunting. As the deer possess a very fine scent they must always be approached from the lee side.

An interesting method of hunting is described by Parry (II, p. 512) and confirmed by Hall (II, p. 178). Parry writes:

> Two men walk directly from the deer they wish to kill, when the animal almost always follows them. As soon as they arrive at a large stone, one of the men hides behind it with his bow, while the other continuing to walk on soon leads the deer within range of his companion's arrows.

Hall says that one hunter hides himself behind a stone while the other utters grunting sounds to attract it.

In winter deer are sometimes caught in traps made by digging holes in the snow and covering them with slabs of the same material. Sometimes urine is poured upon and around the trap or salt water ice is placed upon it, in order to allure the deer (Klutschak, p. 131). Having been attracted to the trap they fall through the roof and are speared in the hole.

Wherever the musk ox is found it is eagerly pursued by the Eskimo. Though dogs are of no use in the chase of the nimble deer, they are of great help in hunting this animal. When a track is found the dogs are let loose and soon overtake the herd. The latter form a circle of defense in which they are kept at bay until the hunter approaches. While the dogs continue attacking and dodging, the musk oxen try to hit them with their horns and do not heed the Eskimo, who assails them at close quarters with a lance to which a thong is frequently attached. When an ox is wounded it makes an impetuous attack on the hunter, who dodges to one side. The dogs being at hand again immediately keep it at bay, thus enabling the hunter to let fly another arrow or throw his lance again. Thus the struggle continues until the greater part of the herd is killed. In rare instances an ox dashes out of the circle and escapes from the pack.

Polar bears are hunted in about the same manner as the musk ox. The Eskimo pursue them in light sledges, and when they are near the pursued animal the traces of the most reliable dogs in the team are cut, when they dash forward and bring the bear to bay. As the hunter gets sufficiently near, the last dogs are let loose and the bear is killed with a spear or with bow and arrow. The best season for bear hunting is in March and April, when the bears come up the fjords and bays in pursuit of the young seals. At this season the she bear is accompanied by the cub which was born in February or March. Its skin and flesh are highly prized by the Eskimo. At some places, for instance at Cape Raper and at Cape Kater on Davis Strait, the she bears dig holes in the snow banks, in which they sleep during

the winter. The natives seek these holes and kill the bear before it awakes.

The chase of the musk ox and that of the bear have become much easier since the introduction of firearms in Arctic America, and the Eskimo can kill their game without encountering the same dangers as formerly.

HUNTING OF SMALL GAME.

Lastly, I mention the methods used in catching smaller animals, such as wolves, foxes, and hares. Wolves are only pursued when they become too troublesome. Frequently they linger about the villages in winter, and when everybody is asleep they attack the store rooms or the dogs, which have the greatest fear of this voracious animal; for, although dogs will brave the bear, they do not venture to resist a single wolf. If a pack of these beasts linger about the village for weeks preying upon the native stores, traps are finally built or the Eskimo lie in ambush near a bait to kill them. The wolf trap is similar to the one used to catch deer. The hole dug in the snow is about eight or nine feet deep and is covered with a slab of snow, on the center of which a bait is laid. A wall is built around it which compels the wolf to leap across it before he can reach the bait. By so doing he breaks through the roof and, as the bottom of the pit is too narrow to afford him jumping room, he is caught and killed there (Rae I, p. 135).

A remarkable method of killing wolves has been described by Klutschak (p. 192) and confirmed by the Eskimo of Cumberland Sound. A sharp knife is smeared with deer's blood and sunk into the snow, the edge only protruding. The wolves lick the knife and cut their tongues so severely as to bleed to death. Another method is to roll a strip of whalebone, about two feet long, in a coil, which is tied up with sinews. At each end a small metal edge is attached to the whalebone. This strip, wrapped in a piece of blubber or meat, is gulped down by the hungry wolf. As it is digested the sinews are dissolved and the elastic strap is opened and tears the stomach of the animal. A very ingenious trap is described by Parry (II, p. 514):

> It consists of a small house built of ice, at one end of which a door, made of the same plentiful material, is fitted to slide up and down in a groove; to the upper part of this a line is attached and, passing over the roof, is led down into the trap at the inner end, and there held by slipping an eye in the end of it over a peg of ice left for the purpose. Over the peg, however, is previously placed a loose grummet, to which the bait is fastened, and a false roof placed over all to hide the line. The moment the animal drags at the bait the grummet slips off the peg, bringing with it the line that held up the door, and this falling down closes the trap and secures him.

Foxes are usually caught in traps. An ice house about six feet high is built of hummocks, which are cut down with the point of the spear. It is covered with ice slabs, only a hole in the center

being left. Blocks of snow and slabs of ice are piled up around the building so as to permit easy access to the roof. Some blood is sprinkled round the hole to attract the fox and a larger bait is placed upon the floor of the house. The fox jumps down and, as the only exit is in the center of the roof, cannot escape. Another trap has a slab of ice erected in such a manner as to fall and kill the fox when he touches the bait.

A third trap, similar to the one above mentioned, has been described by Lyon, p. 339:

> It is like a small lime kiln in form, having a hole near the top, within which the bait is placed, and the foxes (for these animals alone are thus taken) are obliged to advance to it over a piece of whalebone, which, bending beneath their weight, lets them into prison, and then resumes its former position: thus a great number of them are sometimes caught in a night. In the summer they are but rarely taken, and it is then by means of a trap of stones, formed like the ice trap, with a falling door.

Hares are either killed with small shot or with arrows or caught in whalebone snares, as are ermines and lemmings.

Waterfowl of all descriptions are caught in abundance in whalebone nooses (Fig. 452) fastened to a long whalebone line or to a thong.

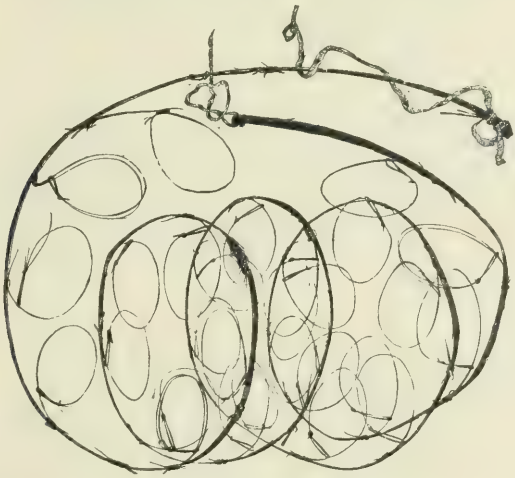
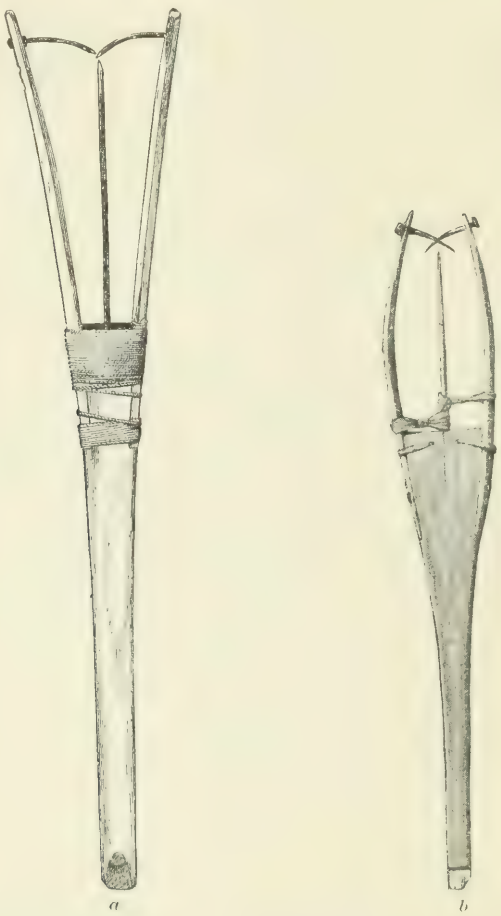


FIG. 452. Whalebone nooses for catching waterfowl. (In the possession of Captain Spicer, of Groton, Conn.)

The line is set along the edge of a lake, particularly near nesting places. In shallow lakes these lines are placed across the water to catch the diving and swimming birds, which are drawn to the shore with the line. On the low egg islands, which are inhabited by innumerable ducks, snares are set on the nests, and great numbers are caught in a short time. Swans and geese are procured in the same way. Other birds, and particularly partridges, are killed with arrows and with small shot.

Large flocks of ducks and other kinds of birds fly through certain valleys in the fall and in spring when migrating. Great numbers are caught here without any difficulty, as they can be killed with sticks.

A favorite method of catching gulls is by building a flat snow house. One block of the roof is translucent and so thin as to permit the hunter, who is hidden in the house, to push his hand through it. A bait is placed on this block, and as soon as a bird alights to feed it is pulled through the roof into the hut.



a *b*

FIG. 453. Kakivang or salmon spear. (National Museum, Washington. *a*, 34087; *b*, 34086.) ¼

By far the greater number of birds are caught during the molting season. Partridges can be caught with the hand and waterfowl are pursued with the kayak. The waterfowl dive as soon as the boat comes near them and being frightened down again as soon as they rise they are eventually drowned. One species of goose (kango)

which frequents the lakes of the country is caught in a remarkable way. A circular wall of stones is raised, with a single entrance. The Eskimo drive a flock of these birds towards the building, one man, whom the stupid creatures follow, leading the way. As soon as they have entered the wall the entrance is shut up and they are slaughtered. If they happen to be met with on the water they are encircled by kayaks and driven towards the shore, one boat leading. Then they are driven within the stone wall as already described.

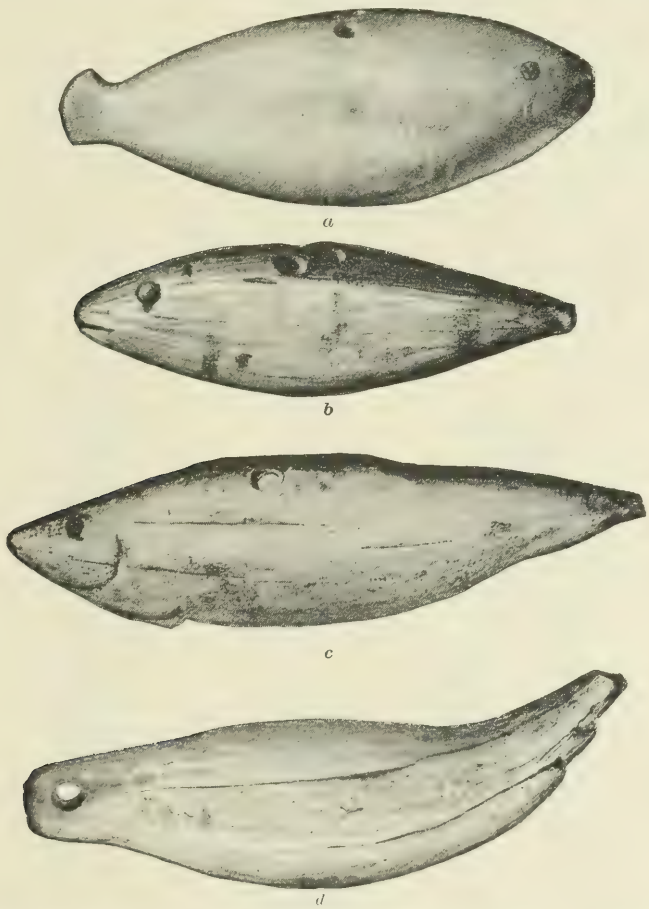


FIG. 454. Ivory fish used as bait in spearing salmon. *a* From Repulse Bay. *a*, *c*, *d* (National Museum, Washington. *a*, 10400; *c*, 34109; *d*, 34124.) ⅓ *b* (Museum für Völkerkunde, Berlin. IV A 6830.) ⅓

FISHING.

The most important fish is the salmon, which is caught in abundance during the summer. When the lakes begin to break up the salmon descend to the sea, following the narrow lead between the

land floe and the water. In some places they are so plentiful as to fill the water completely. Here they are speared with the kakivang (Fig. 453). This instrument consists of a handle which widens towards the end; in the center it has a prong of bone or iron, and two larger ones at the sides, made of deer antlers or musk ox horn. These latter diverge and are furnished with a bone or iron nail on the inner side. The elasticity of these side prongs is increased by thongs or strings holding them tightly together. If the salmon are very plentiful no bait is needed and the natives cannot spear them as quickly as they swim along. When the ice is gone they are caught in the shallow rivers falling from the lakes into the sea. The natives stand on the bank or step into the water. A small ivory fish (Fig. 454) (eχalujang), tied by two or three holes in the back to a plaited string of deer sinews, is used as a bait. Frequently bear's teeth are used for bait. They are attached to a separate line which the hunter continually moves up and down to attract the attention of the fish. When the salmon comes near the bait it is speared with the kakivang. In the left hand the fisherman holds an instrument for stringing the fish (quqartaun), some illustrations of which are given in Fig. 455.

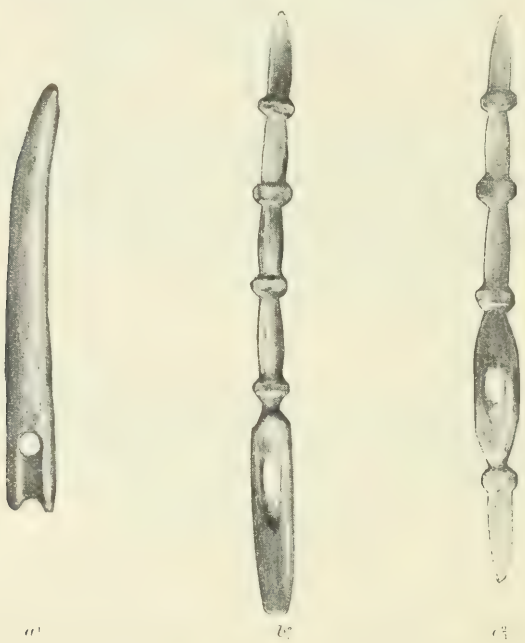


Fig. 455. Quqartaun for stringing fish. *c* (Museum für Völkerkunde, Berlin. IV A 6831.)

It is made of ivory. A thong fastened to the hole of the instrument has a thick knot at the opposite end. As soon as a salmon is caught it is taken out of the nippers (kakivang) and the point of the

quqartaun is pushed into the gills and brought out again at the mouth; thus the fish remains sticking until it is dead. Sometimes it is killed by pushing the ivory point of the instrument into its neck. When dead it is pushed on the thong.

At some places wears are built, above which the fish are caught. These consist of dikes of stones about one and a half or two feet high, which are piled across a creek some distance below high water mark. The salmon cross the wall at high water, but are cut off from the sea at half tide and are speared while there. In other places the forks of rivers are shut off by dikes, above which the salmon gather.

In autumn salmon are caught when ascending the rivers. Sometimes they linger too long in small ponds and, as the rivers quickly dry up at this season, are prevented from getting out of the pools. Here they are caught until late in the season. Some of these ponds freeze to the bottom in winter, and the natives, when visiting them in the spring, cut holes in the ice and take out the frozen fish.

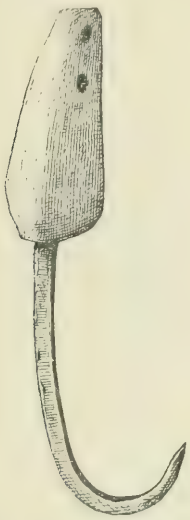


FIG. 456. Salmon hook. (National Museum, Washington. 10142.) ½

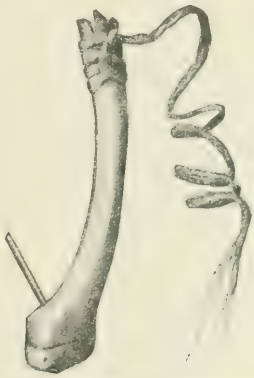


FIG. 457. Salmon hook. (Museum für Völkerkunde, Berlin. 6847.) ½

In the early part of the spring salmon are caught with hooks (kakliokia, Iglulik; niksiartaung, Oqo), holes being cut through the ice of the lake. Formerly the hooks were made of deer antlers. Another device consists of a nail, crooked and pointed at one end, the other being let into a piece of ivory or bone (Fig. 456). A third one is represented in Fig. 457.

The fishing line is made of plaited deer sinews and is either held in the hand or tied to a short rod. Along with these hooks baits are used similar to those mentioned in the foregoing description: If the

carving represented in Fig. 458 is used, the hook is tied to it by means of two holes on the lower side of the fish, while the line passes through its back. The fish, in coming near the bait, is generally caught by the hook in the back or side. In this manner salmon, trout, and all kinds of sea fish are caught.

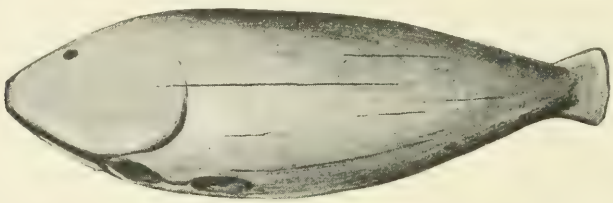


FIG. 458. Bait used in fishing with hooks. (National Museum, Washington. 34108.) ½

I myself have never seen any nets for fishing, but Klutschak found them in use among the Utkusiksalik tribe, and Petitot (Les grands Esquimaux, p. 278), among the natives of Anderson River. The Labrador Eskimo also use nets.

MANUFACTURES.

MAKING LEATHER AND PREPARING SKINS.

Most of the implements of the Eskimo are made of some part of the animals which they pursue. The skins are used for clothing, for building purposes, and for covering the frames of boats. Many implements are made of bone, others of walrus tusks or narwhal horn. As wood is extremely scarce, bone or other parts of animals must make up the deficiency. I shall here describe the methods of preparing these materials.

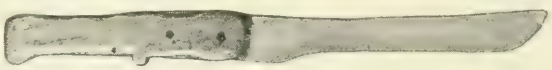
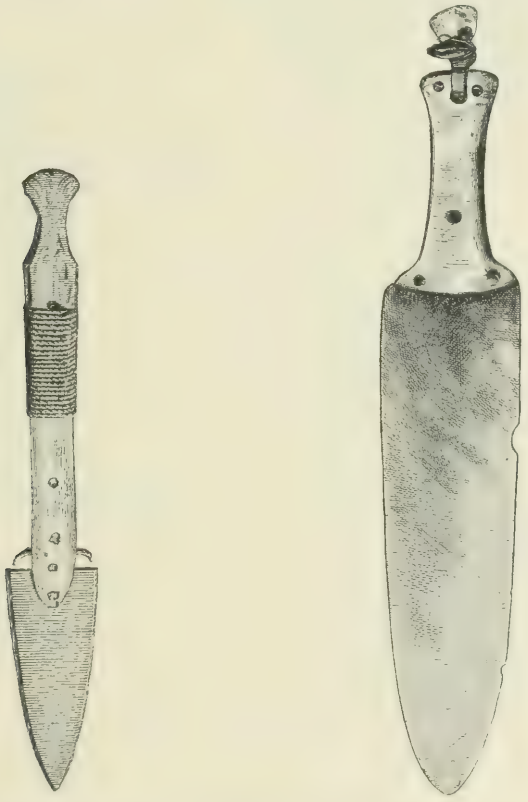


FIG. 459. Butcher's knife with bone handle. (National Museum, Washington. 34090.) ½

The skin of the seal (*Pagomys fœtidus*) is dressed in different ways, according to the purpose for which it is intended. In skinning the animal a longitudinal cut is made across the belly with a common butcher's knife (saving). Most natives have procured this useful instrument and even in olden times a considerable number had found their way from Hudson Bay territory to their countries. The large knives of their own manufacture (pilaut) are of similar form, a metal edge being inserted into an ivory blade. Figure 459 is a more modern knife, an iron blade being fastened to a bone handle.

The skin, with the blubber, is cut from the flesh with the same knife, or still more easily with the pana, the old device of which is represented in Fig. 460 *a* (Parry II, p. 550). This knife is about one foot and a half long (Parry II, p. 503). The use of the small prongs near the blade was not explained by Parry. In Fig. 460 *b* is presented a pana from the eastern coast of Hudson Bay, collected by Dr. R. Bell; the handle is made of bone, the blade of iron. The flippers are cut off at the joints, and thus the whole skin is drawn off in a single piece. In dressing the animal the natives open the belly and first scoop out the blood, then the entrails are taken out, the ribs are separated from the breast bone and from the vertebræ, the fore flippers (with the shoulders and the hind flippers) are taken out, the only part remaining being the head, the spinal column, and the rump bone. Generally these are not eaten, but are used for dogs' food.



a *b*

FIG. 460. Pana or knife for dissecting game. *a* (From Parry II, p. 548.) *b* (American Museum of Natural History.)

The knife (ulo) used by the women serves to clean and prepare the skins. This implement, with which almost all the cutting is done, is shaped like a crescent, the handle being attached to the center, and

greatly resembles a mincing knife. Fig. 461 represents the form which is now in use. Fig. 462 is a very old ulo handle from a stone circle on Qeqertuqdjuaq (Cape Broughton). It is made of bone and has a slit for the slate blade. It is worth remarking that this blade had not been riveted to the handle, but fastened with a kind of glue

Fig. 461. Form of ulo now in use. (Museum für Völkerkunde, Berlin. IV A 6733.) ⅓

Fig. 462. Old ulo with top of handle broken off from Cape Broughton, Davis Strait. (Museum für Völkerkunde, Berlin.) ⅓

(see p. 526). There are a few arrow and harpoon heads the blades of which are inserted in the same manner; the bone is heated and the blade is inserted while it is hot. As it is cooling the slit becomes narrower and the blade is firmly squeezed into the bone handle. Part of a slate blade, which had been riveted to the handle, is shown in Fig. 463. Fig. 464 represents a handle from a recent grave.

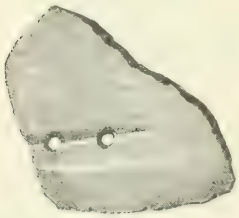


Fig. 463. Fragment of an ulo blade of slate. (Museum für Völkerkunde, Berlin. IV A 6714.) ⅓

Fig. 464. Ulo handle from recent grave. (National Museum, Washington. 34127.)

In preparing the skin the women spread it over a piece of whalebone (asimautang), a small board, or a flat stone, and sit down before it, resting on their knees, the feet bent under the thighs. They hold the skin at the nearest edge and, pushing the ulo forward, remove the blubber from it and deposit the latter in a small tub which stands near the board. As they proceed to the opposite end of the skin, the finished part is rolled up and held in the left hand.

If the skin is to be used with the hair on it, the tough membrane (mami) which covers the inner side is removed in the same way as the blubber and, after it has been carefully patched up and holes have been cut all around the edge, is stretched over a gravelly place or on snow by means of long pegs (pauktun), which hold it a few inches above the ground, thus allowing the air to circulate underneath it. The skin itself is washed and rubbed with gravel, snow, or ice and every hole made by the bullet or by the spear or in preparing it is sewed up. It very seldom happens that the women in preparing it damage the skin or even the thin mami. It is particularly difficult to split the skin near a hole. First they finish the work all around it and then carefully sever the membrane at its edge. The skin is dried in the same way as the membrane. In the early part of spring, though it may still be very cold, a few choice young sealskins are dried on snow walls which face to the south.

FIG. 465. Modern tesirqun or scraper. (Museum für Völkerkunde, Berlin. IV A 6734.)

FIG. 466. Old style of tesirqun or scraper. (Museum für Völkerkunde, Berlin.)

In order thoroughly to dry a sealskin one fine warm spring day is needed. If the Eskimo are greatly in need of skins they dry them in winter over the lamps. A frame is made of four poles, lashed together, according to the size of the skin. A thong passes through the slits along its edge and around the frame, keeping the skin well stretched. Thus it is placed over the lamps or near the roof of the hut. However, it is disagreeable work to dry the skins inside the huts, and, as they are much inferior to those which are dried on the ground, the Eskimo avoid it if they can. When so prepared the sealskins are only fit for covering tents, making bags, &c.; they are far too hard to be used for clothing, for which purpose the skin of yearlings is almost exclusively used. The young seals, having shed

for the first time, have a very handsome coat, the hair being of a fine texture and much longer than in older animals. From the middle of May until late in summer their skins are most suitable for the manufacture of summer clothing, but it is necessary to protect the carcasses of the killed animals from the burning rays of the sun as soon as possible or the skin would be quickly spoiled.

After being dried they are cleaned with the sharp scraper (tesirqun), the modern device of which is represented in Fig. 465. It consists of a handle having a round back and a flat front, with two grooves for the knuckles of the first and second fingers, while the thumb and the other fingers clasp the handle. The scraper itself consists of a rounded piece of tin riveted to the handle. The old scraper (Fig. 466) was made of a deer's shoulder or of some other bone. I have never seen any that were made of a thigh bone, similar to those found by Lucien M. Turner in Ungava Bay.

After being scraped the skin is soaked in salt water and washed again. As soon as it is dry it is softened with the straight scraper (seligoung) (Fig. 467).

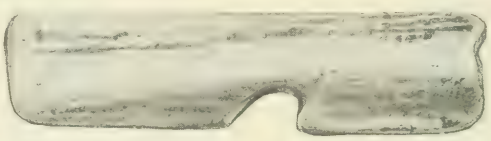


Fig. 467. Seligoung or scraper used for softening skins. (Museum für Völkerkunde, Berlin. IV A 6697.)

Fig. 468 shows some very old stone scrapers found in graves. As the stones are sharpened it is probable that they were used for cleaning the skins. The hole in the right side of the handle is used for the second finger, the grooves on the back for the third and fourth. The bone is fastened to the handle by whalebone straps or thongs.

Skins of *Phoca annellata*, *Phoca cristata*, and *Phoca grœnlandica* are prepared in the same way.

Those which are intended for kayak covers, boots, mittens, quivers, &c. are prepared in a different way. They are either put into hot water or laid in a brook for a few days until the hair begins to loosen. Then both sides are worked with the ulo, in order to clean and shave them. When the hair is removed they are dried and made pliable in the same way as has been described. If it is intended to make the skin as soft as possible it is allowed to become putrid before it is cleansed. Then the hair and the blubber are removed, and afterwards it is left to hang in the sun for a few days until it acquires a light color.

The large ground seal (*Phoca barbata*) is skinned in a different manner. Its skin is very thick, thicker even than sole leather, and therefore extremely durable and suitable for all sorts of lines, particularly traces, lashings, and harpoon lines, and for soles, drinking

cups, and boat covers. This seal is very large, sometimes attaining a length of ten feet. The skin of the back and of the breast dries unequally, and therefore a piece covering the throat and breast is taken

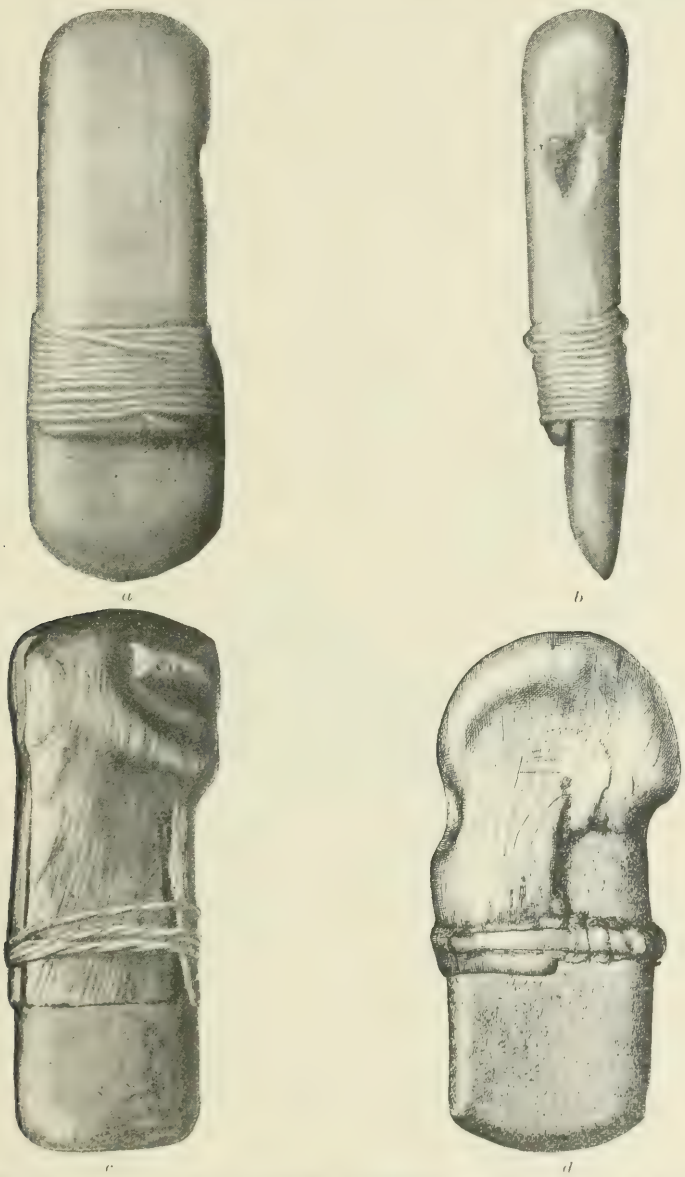


FIG. 168. Old stone scrapers found in graves. (National Museum, Washington. *a*, *b*, 34083; *c*, 34084; *d*, 34085.)

out before the rest is skinned, and the parts are dried separately. If it is to be used for lines it is cut by making girdles about six inches in width around the body. The hair and the blubber are removed from

these cylindrical rings, from which lines are made by cutting spirally, a strip seventy or eighty feet long being thus obtained. This line is stretched as taut as possible between two rocks, and while drying it undergoes an enormous tension. Before being taken from the rocks the edges are rounded and cleaned with a knife.

Walrus hide is always cut up before being prepared. As soon as the walrus is killed it is cut into as many parts as there are partners in the hunt, every part being rolled up in a piece of skin and carried home in it. Sometimes the skin is used for making boats, but generally it is cut into lines. Both kinds of hide, that of the walrus and that of the ground seal, are as stiff as a board when dried and require much work before being fit for use. They are chewed by the natives until they become thin and pliable. The whole skin must be chewed in this way before it can be used for soles and boat covers. Afterwards it is scraped with the tesirqun and softened with the straight scraper. The new thongs, after being dried between the rocks, must also be chewed until they become sufficiently pliable, after which they are straightened by a stretcher that is held with the feet (Fig. 469). Frequently they are only pulled over the sole of the boot for this purpose, the man taking hold of the line at two points and pulling the intermediate part by turns to the right and to the left over the sole of the foot.

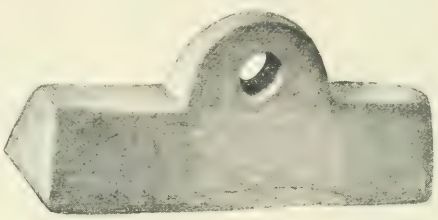


FIG. 469.- Stretcher for lines. (National Museum, Washington. 9836.) ⅓

Another kind of line is cut from the hide of the white whale, which is skinned in the same way as the ground seal, but, as it must be slit on the spinal column, the single pieces of line are much shorter, and they cannot be used to the same extent as seal lines. Some lines are cut from the skins of *Pagomys fœtidus*, but these are weak and greatly inferior to lines of ground seal hide.

Deerskins are dried in summer and dressed after the ice has formed. Like all other kinds of skins they are not tanned, but curried. They are hung up among the rafters of the hut, and the workers — in Oqo and Akudnirn the women, in Hudson Bay the men — take off their jackets and begin preparing them with the sharp scraper. After being cleaned in this way they are thoroughly dried, either by hanging them near the roof of the hut or, according to Gilder, by wrapping them around the upper part of the body next to the skin, after

which they are again scraped with the tesirqun. This done, the flesh side is wetted, the skin is wrapped up for half a day or a day, and afterwards undergoes a new scraping. Then it is chewed, rubbed, and scraped all over, thus acquiring its pliability, softness, and light color.

In the spring the skins of bears and of seals are sometimes dried on large frames which are exposed to the sun, the skins being tied to the frames with thongs. Smaller quadrupeds, as foxes and ermines, are skinned by stripping the entire animal through its mouth without making a single cut in the skin. Birds are opened at the breast and the body is taken out through this small hole, the head, wings, and legs being cut off at the neck and the other joints. Ducks are frequently skinned by cutting the skin around the head and the outer joints of the wings and legs and stripping it off. The skins are cleaned by sucking out the fat and chewing them.

Skins of salmon are used for water proof bags; intestines of seals, particularly those of ground seals, are carefully dried and after being sewed together are used for sails, windows, and kayak jackets.

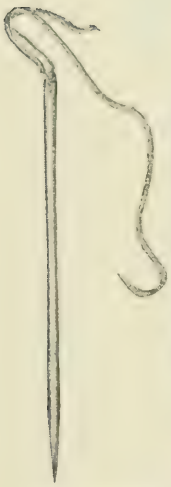


FIG. 470. Ivory needle. (National Museum, Washington. 34135.) ½

FIG. 471. Ivory needle case from Cumberland Sound. (Museum für Völkerkunde, Berlin. 6832.) ½

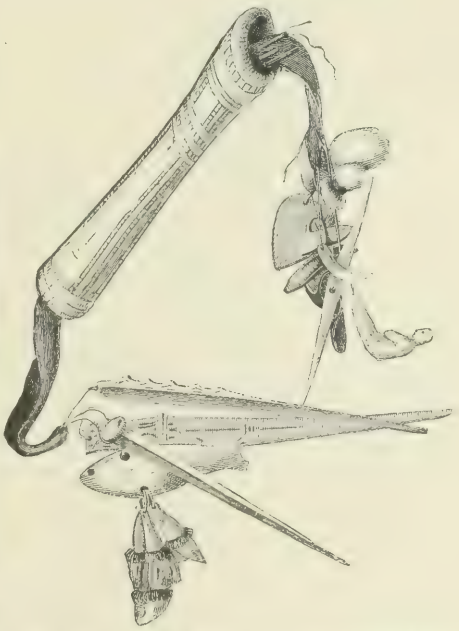


FIG. 472. Common pattern of needle case Iglulik. (From Parry II, p. 548.)

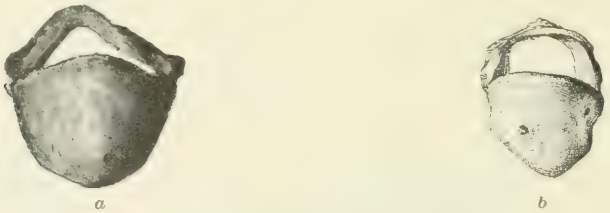
SUNDRY IMPLEMENTS.

The sewing is done with thread made of deer or white whale sinews. Particularly are those sinews at the back dried and when intended for use they can easily be split as thin as required. At present steel needles are in general use. Wherever they are wanting ivory ones of the same pattern are used (Fig. 470). The thread is fastened

to the eyehole by a kind of loop, the short end being twisted around the longer one. Kumlien described a needle of a very different device (p. 25):

> This tool was almost exactly like an awl in shape, but had an eye near the point. They must have had to thread this instrument for each stitch. The needle part was apparently of deer horn and the handle of walrus ivory.

Probably it was used like a packing needle for sewing tent covers, &c. The needles (mirqun) are kept in ivory needle cases (umī'u-jang). The case represented in Fig. 471 is from a grave in Cumberland Sound. The grooves on both sides are evidently intended for a leather strap which is to be tied around it. This specimen is closed at the bottom and had a stopper for closing the mouth. Fig. 472 is a more common pattern. The ivory piece forms a tube through which a leather strap passes. The needles are stuck into the leather and drawn into the tube. Small ivory implements and ornaments are attached to both ends of the strap.



a *b*

Fig. 473. Tikiq or thimble. (National Museum, Washington. 10181.) ½

Thimbles (tikiq) (Fig. 473) are made of an oblong piece of ground sealskin, fitting to the point of the first finger. A rim is cut around half of its circumference and thus it can be drawn over the finger. The women sew by pulling the thread toward them and making an overcast seam.

Whalebone is used for making elastic thongs and in the place of wood; for example, for kayak ribs, for the rim of the kayak hole, boxes, &c. It requires no particular preparation, being easily split and shaped so as to fit any purpose. If wood is to be bent into hoops or deer horn is to be straightened, it is made pliable by being put into boiling water for some time. Bones of whales and other large animals and the penis bone of the walrus are used instead of poles. In olden times, when iron was extremely rare and an effective saw could not be procured, they split the bone by drilling many holes, one close to the other, afterwards breaking the pieces asunder.

Small pieces of bone, used for arrows &c., were straightened, after being steamed, with the implement represented in Fig. 474.

The drill (Fig. 475) is the most important implement for working in ivory and bone. It consists of three parts : the bow with its string

(niuqtung), the drill (qaivun), and the mouthpiece (qingmiaq). The string of the bow is twisted around the shaft of the drill, the mouth-

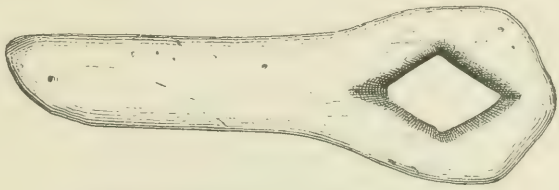


FIG. 474. Instrument for straightening bones.

piece (which is made of wood or of bone) is taken into the mouth, and the rounded end of the drill is placed in its hole. Then the whole implement is put firmly against the place to be perforated and is set in motion by moving the bow. Instead of the latter, a string is sometimes used with a handle at each end. For one man, however, the first device is handier. The string of the second form is usually pulled by one man while the other holds the mouthpiece.

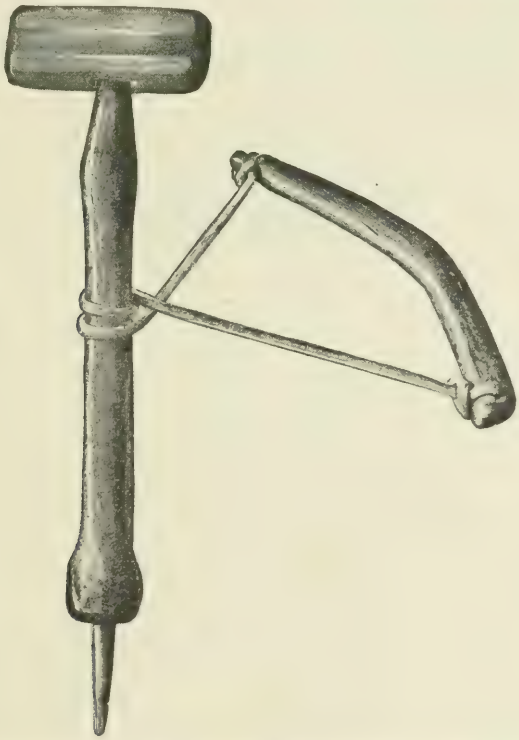


FIG. 475. Drill for working in ivory and bone. (National Museum, Washington. 34114.)

The same instrument is sometimes used for making fire. Instead of the iron, a piece of hard wood (ground willow) is put into the

mouthpiece and placed upon a piece of driftwood cut to the shape represented in Fig. 476. The wooden drill turns rapidly in a hole of the driftwood until it begins to glow. A little moss is applied to the glowing wood and gently blown until it begins to burn. Wherever flint and pyrite are to be had these are used for striking fire. Moss or the wool-like hair of *Eryophorum* serves for tinder.

Fig. 476. Driftwood used in kindling fire from Nugumiut. (National Museum, Washington. 10258.) ½

Ivory implements are cut out of the tusks with strong knives and are shaped by chipping pieces from the blocks until they acquire the desired forms. In olden times it must have been an extremely troublesome work to cut them out, the old knives being very poor and ineffective. They are finished with the file, which on this account is an important tool for the natives; it is also used for sharpening knives and harpoons. The women's knives are cut, by means of files, from old saw blades; the seal harpoons, from Scotch whale harpoons. If files are not obtainable, whetstones are used for sharpening the iron and stone implements.

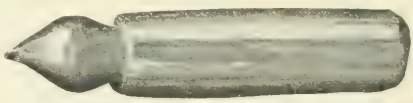


Fig. 477. Eskimo graver's tool. (National Museum, Washington. 34105.) ½

Engravings in bone and ivory are made with the implement represented in Fig. 477. An iron point is inserted in a wooden handle; formerly a quartz point was used. The notch which separates the head from the handle serves as a hold for the points of the fingers. The designs are scratched into the ivory with the iron pin.

Stone implements were made of flint, slate, or soapstone. Flint was worked with a squeezing tool, generally made of bone. Small pieces were thus split off until the stone acquired the desired form. Slate was first roughly formed and then finished with the drill and the whetstone. The soft soapstone is now chiseled out with iron tools. If large blocks of soapstone cannot be obtained, fragments are cemented together by means of a mixture of seal's blood, a kind of clay, and dog's hair. This is applied to the joint, the vessel being heated over a lamp until the cement is dry. According to Lyon (p. 320) it is fancied that the hair of a bitch would spoil the composition and prevent it from sticking.

TRANSPORTATION BY BOATS AND SLEDGES.

THE BOAT (UMIAQ).

The main part of the frame of a boat is a timber which runs from stem to stern (Fig. 478). It is the most solid part and is made of driftwood, which is procured in Hudson Strait, Hudson Bay, and on

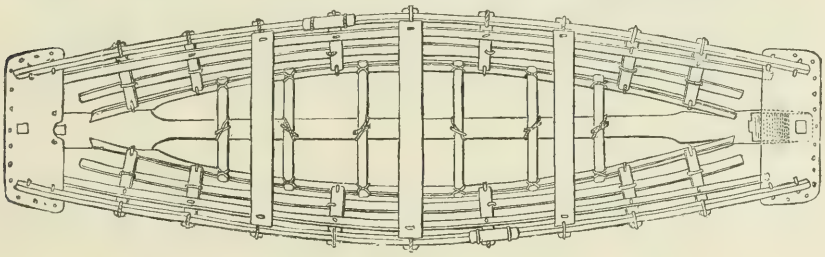


FIG. 478. Framework of Eskimo boat.

the northern shore of King William Land. In Iglulik, and probably in Pond Bay, boats are rarely used and never made, as wood is wanting. The central part of this timber is made a little narrower than the ends, which form stout heads. A mortise is cut into each of the latter, into which posts (kiglo) are tenoned for the bow and for the stern. The shape of this part will best be seen from the engraving (Fig. 479). A strong piece of wood is fitted to the top of these uprights and the gunwales are fastened to them with heavy thongs.

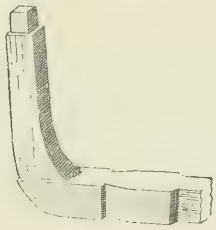


FIG. 479. Kiglo or post.

The gunwales and two curved strips of wood (akuk), which run along each side of the bottom of the boat from stem to stern, determine its form. These strips are steadied by from seven to ten cross pieces, which are firmly tied to them and to the central piece. From this pair of strips to the gunwales run a number of ribs, which stand somewhat close together at the bow and the stern, but are separated by intervals of greater distance in the center of the boat. The cross pieces along the bottom are arranged similarly to the ribs. Between the gunwale and the bottom two or three pairs of strips also run along the sides of the boat and steady its whole frame. The uppermost pair (which is called tuving) lies near the gunwale and serves as a fastening for the cover of the boat. The thwarts, three

or four in number, are fastened between the gunwale and these lateral strips. All these pieces are tied together with thongs, rivets not being used at all.

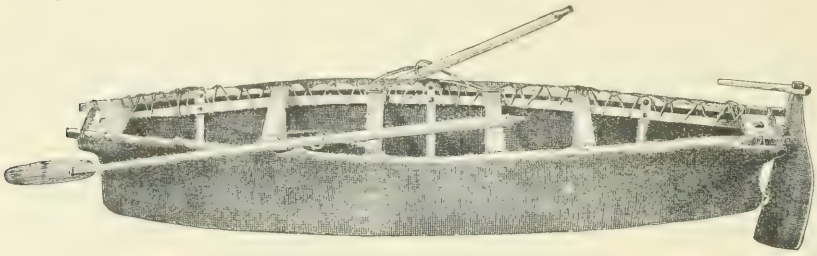
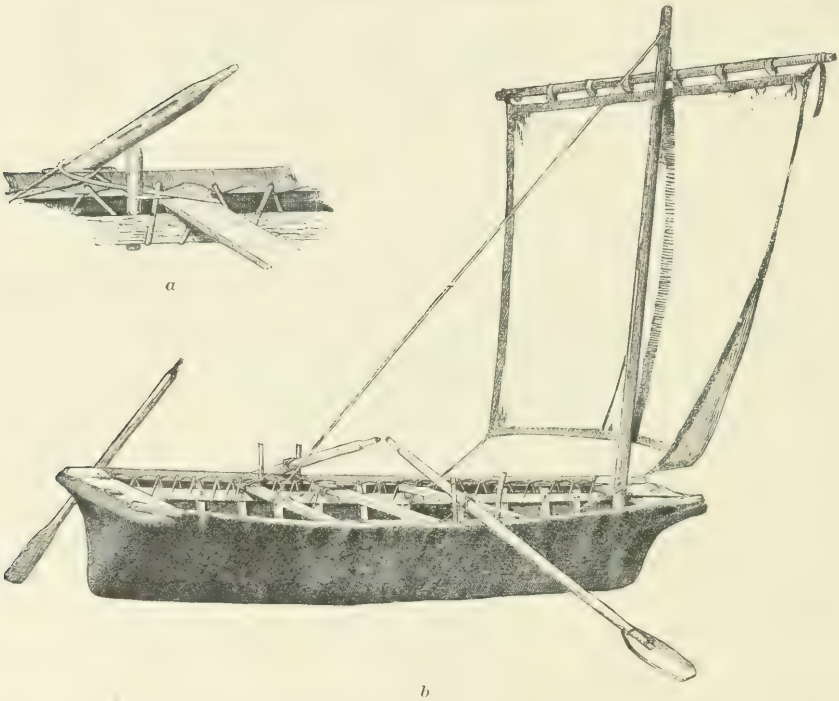


FIG. 480. Umiaq or skin boat.



a

b

FIG. 481. Umiaq or skin boat.

The frame is covered with skins of ground seals (Figs. 480, 481). It requires three of these skins to cover a medium sized boat; five to cover a large one. If ground seals cannot be procured, skins of harp or small seals are used, as many as twelve of the latter being required. The cover is drawn tightly over the gunwale and, after being wetted, is secured by thongs to the lateral strip which is close to the gunwale. The wooden pieces at both ends are perforated and the thongs for fastening the cover are pulled through these holes.

The boat is propelled by two large oars. The rowlocks are a very ingenious device. A piece of bone is tied upon the skin in order

to protect it from the friction of the oar, which would quickly wear it through (Fig. 481 *a*). On each side of the bone a thong is fastened to the tuving, forming a loop. Both loops cross each other like two rings of a chain. The oar is drawn through both loops, which are twisted by toggles until they become tight. Then the toggles are secured between the gunwale and the tuving.

The oar (ipun) consists of a long shaft and an oval or round blade fastened to the shaft by thongs. Two grooves and the tapering end serve for handles in pulling. Generally three or four women work at each oar.

For steering, a paddle is used of the same kind as that used in whaling (see p. 499). A rudder is rarely found (Fig. 480), and when used most probably is made in imitation of European devices.

If the wind permits, a sail is set; but the bulky vessel can only run with the wind. The mast is set in the stem, a mortise being cut in the forehead of the main timber, with a notch in the wooden piece above it to steady it. A stout thong, which passes through two holes on each side of the notch, secures the mast to the wooden head piece. The sail, which is made of seal intestines carefully sewed together, is squared and fastened by loops to a yard (sadniriaq) which is trimmed with straps of deerskin. It is hoisted by a rope made of sealskin and passing over a sheave in the top of the mast. This rope is tied to the thwart farthest abaft, while the sheets are fastened to the foremost one.

THE SLEDGE AND DOGS.

During the greater part of the year the only passable road is that afforded by the ice and snow; therefore sledges (qamuting) of different constructions are used in traveling.

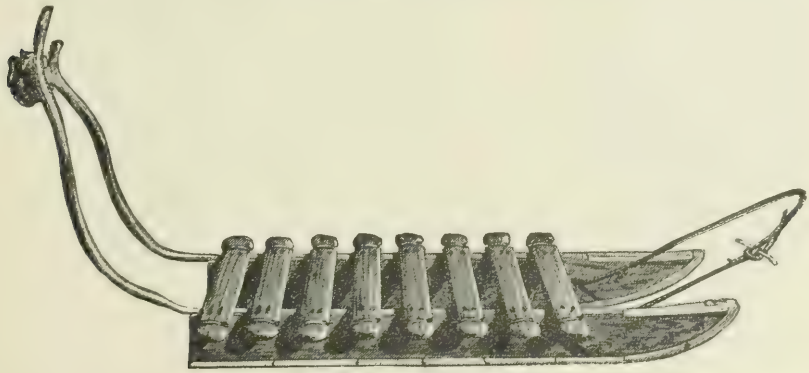


FIG. 482. Qamuting or sledge.

The best model is made by the tribes of Hudson Strait and Davis Strait, for the driftwood which they can obtain in abundance admits the use of long wooden runners. Their sledges (Fig. 482) have two runners, from five to fifteen feet long and from twenty inches to two

and a half feet apart. They are connected by cross bars of wood or bone and the back is formed by deer's antlers with the skull attached. The bottom of the runners (qamun) is curved at the head (uinirn) and cut off at right angles behind. It is shod with whalebone, ivory, or the jawbones of a whale. In long sledges the shoeing (pirqang) is broadest near the head and narrowest behind. This device is very well adapted for sledging in soft snow; for, while the weight of the load is distributed over the entire length of the sledge, the fore part, which is most apt to break through, has a broad face, which presses down the snow and enables the hind part to glide over it without sinking in too deeply.

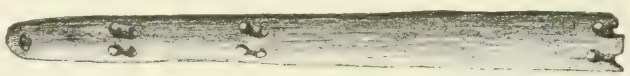


FIG. 483. Sledge shoe. (National Museum, Washington. 34096.) ¼

The shoe (Fig. 483) is either tied or riveted to the runner. If tied, the lashing passes through sunken drill holes to avoid any friction in moving over the snow. The right and left sides of a whale's jaw are frequently used for shoes, as they are of the proper size and permit the shoe to be of a single piece. Ivory is cut into flat pieces and riveted to the runner with long treenails. The points are frequently covered with bone on both the lower and upper sides, as they are easily injured by striking hard against hummocks or snowdrifts. Sometimes whalebone is used for the shoes.

The cross bars (napun) project over the runners on each side and have notches which form a kind of neck. These necks serve to fasten the thongs when a load is lashed on the sledge. The bars are fastened to the runners by thongs which pass through two pairs of holes in the bars and through corresponding ones in the runners. If these fastenings should become loose, they are tightened by winding a small thong round them and thus drawing the opposite parts of the thong tightly together. If this proves insufficient, a small wedge is driven between the thong and the runner.

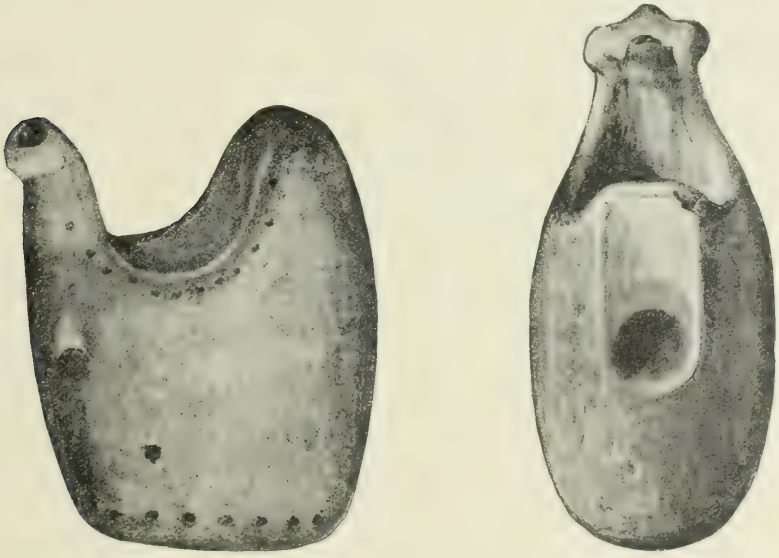
The antlers attached to the back of the sledge have the branches removed and the points slanted so as to fit to the runners. Only the brow antlers are left, the right one being cut down to about three inches in length, the left one to one and a half inches. This back forms a very convenient handle for steering the sledge past hummocks or rocks, for drawing it back when the points have struck a snowdrift, &c. Besides, the lashing for holding the load is tied to the right brow antler and the snow knife and the harpoon line are hung upon it.

Under the foremost cross bar a hole is drilled through each runner. A very stout thong (pitu) consisting of two separate parts passes through the holes and serves to fasten the dogs' traces to the sledge.

A button at each end of this thong prevents it from slipping through the hole of the runner. The thong consists of two parts, the one ending in a loop, the other in a peculiar kind of clasp (partirang).

FIG. 484. Clasp for fastening traces to sledge. (National Museum, Washington. 34110.) ½

Fig 484 represents the form commonly used. The end of one part of the thong is fastened to the hole of the clasp, which, when closed, is stuck through the loop of the opposite end (see Fig. 482). A more artistic design is shown in Fig. 485. One end of the line is tied to the hole in the under side of this implement. When it is in use the loop of the other end is stuck through another hole in the center and hung over the nozzle. The whole represents the head of an animal with a gaping mouth. The dogs' traces are strung upon this line by means of the uqsirn, an ivory implement with a large and a small eyelet (Fig. 486). The trace is tied to the former, while the latter is strung upon the pitu.



a *b*

FIG. 485. Artistic form of clasp for fastening traces to sledge. (Museum für Völkerkunde, Berlin.) ½

The dogs have harnesses (ano) made of sealskin (Fig. 487) or sometimes of deerskin, consisting of two bights passing under the fore legs. They are joined by two straps, one passing over the breast, the other over the neck. The ends are tied together on the back, whence the trace runs to the sledge. According to Parry (II, p. 517),

the Iglulik harnesses consisted of three bights, one passing over the breast and shoulder and two under the fore legs.

a *b*

FIG. 486. Uqsirn, for fastening traces to pitu. *a* (National Museum, Washington. 34122.) ¼ *b* (Museum für Völkerkunde, Berlin.) ¼

It was mentioned at another place (p. 475) that in sealing a dog is taken out of the sledge to lead the hunter to the breathing hole.

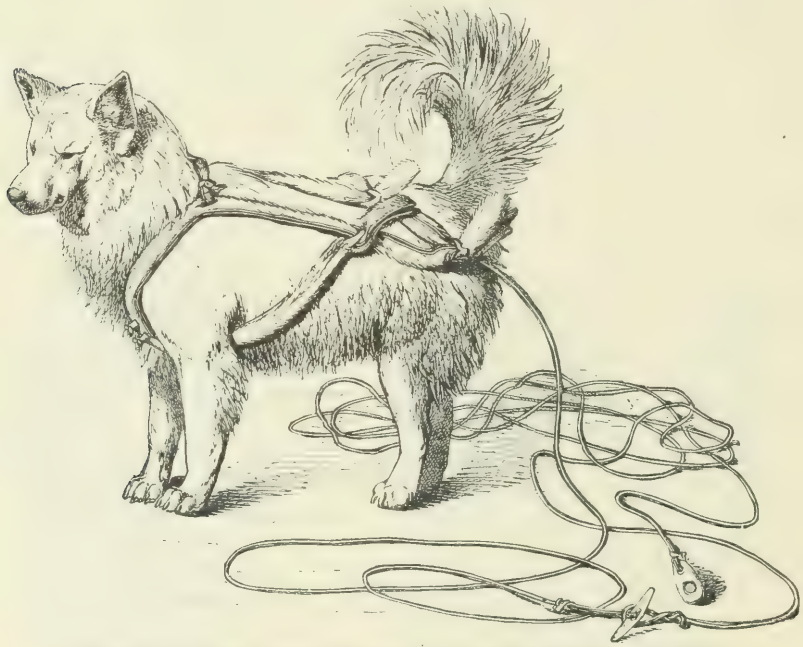


FIG. 487. Ano or dog harness. (Museum für Völkerkunde, Berlin. IV A 6730.)

For this purpose the traces of some harnesses are made of two pieces, which are united by the sadniriaq, a clasp similar to that of the pitu (Figs. 487, 488). If the dog is to be taken from the sledge the fore part of the trace is unbuttoned.

FIG. 488. Sadniriaq or clasp. (National Museum, Washington.) ⅔

Besides this form of sledge a great number of others are in use. Whenever whales are caught their bone is sawed or cut into large pieces, which are shod with the same material. If large bones are not to be had, a substitute is found in walrus skins or rolls of seal-skins, which are wetted and sewed up in a bag. This bag is given the desired form and after being frozen to a solid mass is as serviceable as the best plank. In Boothia frozen salmon are used in the same way and after having served this purpose in winter are eaten in the spring. Other sledges are made of slabs of fresh water ice, which are cut and allowed to freeze together, or of a large ice block hollowed out in the center. All these are clumsy and heavy and much inferior to the large sledge just described.

Parry (II, p. 515) states that at Iglulik the antlers are detached from the sledge in winter when the natives go sealing. The tribes of Davis Strait do not practice this custom, but use scarcely any sledge without a pair of antlers.

As to the appearance of the dogs I would refer to Parry (II, p. 515) and other writers and confine my remarks to a description of their use by the Eskimo.

As the traces are strung upon a thong, as just described, the dogs all pull at one point; for that reason they may seem, at first sight, to be harnessed together without order or regularity; but they are arranged with great care. The strongest and most spirited dog has the longest trace and is allowed to run a few feet in advance of the rest as a leader; its sex is indifferent, the choice being made chiefly with regard to strength. Next to the leader follow two or three strong dogs with traces of equal length, and the weaker and less manageable the dogs the nearer they run to the sledge. A team is almost unmanageable if the dogs are not accustomed to one another. They must know their leader, who brings them to terms whenever there is a quarrel. In a good team the leader must be the acknowledged chief, else the rest will fall into disorder and refuse to follow him. His authority is almost unlimited. When the dogs are fed, he takes the choice morsels; when two of them quarrel, he bites both and thus brings them to terms.

Generally there is a second dog which is inferior only to the leader, but is feared by all the others. Though the authority of the leader is not disputed by his own team, dogs of another team will not submit to him. But when two teams are accustomed to travel in company the dogs in each will have some regard for the leader of the other, though continuous rivalry and quarrels go on between the two leaders. Almost any dog which is harnessed into a strange team will at first be unwilling to draw, and it is only when he is thoroughly accustomed to all his neighbors and has found out his friends and his enemies that he will do his work satisfactorily. Some dogs when put into a strange team will throw themselves down and struggle and

howl. They will endure the severest lashing and allow themselves to be dragged along over rough ice without being induced to rise and run along with the others. Particularly if their own team is in sight will they turn back and try to get to it. Others, again, are quite willing to work with strange dogs.

Partly on this account and partly from attachment to their masters, dogs sold out of one team frequently return to their old homes, and I know of instances in which they even ran from thirty to sixty miles to reach it. Sometimes they do so when a sledge is traveling for a few days from one settlement to another, the dogs not having left home for a long time before. In such cases when the Eskimo go to harness their team in the morning they find that some of them have run away, particularly those which were lent from another team for the journey. In order to prevent this the left fore leg is sometimes tied up by a loop which passes over the neck. When one is on a journey it is well to do so every night, as some of the dogs are rather unwilling to be harnessed in the morning, thus causing a great loss of time before they are caught. In fact such animals are customarily tied up at night, while the others are allowed to run loose.

Sometimes the harnesses are not taken off at night. As some dogs are in the habit of stripping off their harness, it is fastened by tying the trace around the body. Though all these peculiarities of the dogs give a great deal of trouble to the driver, he must take care not to punish them too severely, as they will then become frightened and for fear of the whip will not work at all.

Before putting the dogs to the sledge it must be prepared and loaded. In winter the shoes of the runners are covered with a thick coat of ice, which diminishes the friction on the snow. If the shoes are of good bone, ivory, or whalebone, the icing is done with water only, the driver taking a mouthful and carefully letting it run over the shoe until a smooth cover of about one third of an inch in thickness is produced. The icicles made by the water which runs down the side of the runner are carefully removed with the snow knife, and the bottom is smoothed with the same implement and afterward somewhat polished with the mitten. Skin runners and others which have poor shoes are first covered with a mixture of moss and water or clay and water. This being frozen, the whole is iced, as has been described. Instead of pure water, a mixture of blood and water or of urine and water is frequently used, as this sticks better to the bone shoe than the former.

This done, the sledge is turned right side up and loaded. In winter, when the snow is hard, small sledges with narrow shoes are the best. In loading, the bulk of the weight is placed behind. When the snow is soft or there are wide cracks in the floe, long sledges with broad shoes are by far the best. In such cases the heaviest part of the load is placed on the middle of the sledge or even nearer the head.

Particularly in crossing cracks the weight must be as near the head as possible, for if the jump should be unsuccessful a heavy weight at the hind part would draw the sledge and the dogs into the water.

The load is fastened to the sledge by a long lashing (naqetarun). This is tied to the first cross bar and after passing over the load is drawn over the notch of the next bar, and so on from one notch, over the load, to a notch on the opposite side. After having been fastened in this way it is tightened. Two men are required for the work, one pulling the lashing over the notch, the other pressing down the load and lifting and lowering the thong in order to diminish the friction, thus making the pulling of the other man more effective. The end is fastened to the brow antler. Implements which are used in traveling are hung upon the antlers at the back of the sledge. In spring, when the snow is melting and water is found under it, the travelers frequently carry in their pouch a tube for drinking (Fig. 489).

FIG. 489. Tube for drinking. (National Museum, Washington. 10383.) ⅓

When the sledge has been loaded the dogs are hitched to it and the driver takes up the whip and is ready for starting. The handle of the whip is about a foot or a foot and a half in length. It is made of wood, bone, or whalebone and has a lash of from twenty to twenty-five feet in length. The lash is made of walrus or ground seal hide, the lower end being broad and stiff, thus giving it greater weight and a slight springiness near the handle, which facilitates its use. A broad piece of skin clasps the handle, to which it is tied with seal thongs. Another way of making the lower part heavy is by plaiting ground seal lines for a length of a foot or a foot and a half.

When starting the driver utters a whistling guttural sound which sounds like h! h!, but cannot exactly be expressed by letters, as there is no vowel in it, and yet on account of the whistling noise in the throat it is audible at a considerable distance. The dogs, if well rested and strong, jump to their feet and start at once. If they are lazy it requires a great deal of stimulating and lashing before they make a start. If the load is heavy it is difficult to start it and the Eskimo must use some strategy to get them all to pull at once. The sledge is moved backward and forward for about a foot, so as to make a short track in which it moves easily. Then the driver sings out to the dogs, at the same time drawing the traces tight with his hands and pulling at the sledge. The dogs, feeling a weight at the traces, begin to draw, and when the driver suddenly lets go the traces the sledge receives a sudden pull and begins to move. If assistance is at hand the sledge may be pushed forward until it gets under way.

It is extremely hard work to travel with a heavy load, particularly in rough ice or on soft snow. The dogs require constant stimulating; for this purpose a great number of exclamations are in use and almost every Eskimo has his own favorite words for driving. The general exclamation used for stimulating is the above mentioned h! h! or aq! aq! which is pressed out from the depths of the breast and the palate, the vowel being very indistinct. Others are: djua! the a being drawn very long and almost sung in a high key, or ah! pronounced in the same way; ıatit! or jauksa koksa! and smacking with the tongue. If a seal is seen basking on the ice or if the sledge happens to pass a deserted snow hut, the driver says, Ha! Do you see the seal? Ai! A seal! a seal! (Ha! Takuviuk? Ai! Uto! uto!) and Ai! There is a house; a small house! (Ai! Iglu; igluaqdjung!) or, Now we go home! (Sarpoq! Sarpoq!) The latter, however, are only used when the dogs are going at a good rate.

For directing the sledge the following words are used: Aua, aua! Aua! ja aua! for turning to the right; χoiaχoi! ja χoia! for turning to the left. In addition the whip lash is thrown to the opposite side of the dogs. The leader is the first to obey the order, but a turn is made very slowly and by a long curve. If the driver wants to make a sharper turn he must jump up and run to the opposite side of the sledge, throwing the whip lash at the same time toward the team. For stopping the dogs the word Ohoha! pronounced in a deep key, is used.

If the traveling is difficult the driver must walk along at the right side of the sledge and wherever hummocks obstruct the passage he must direct it around them either by pushing its head aside or by pulling at the deer's skull at the back. But notwithstanding all this stimulating and all the pulling the sledge is frequently stopped by striking a piece of ice or by sinking into soft snow. As soon as it sinks down to the cross bars it must be lifted out, and when the load is heavy the only means of getting on is by unloading and afterwards reloading. In the same way it must be lifted across hummocks through which a road is cut with the end of the spear, which, for this purpose, is always lashed in a place where it is handy for use, generally on the right side of the bottom of the sledge. The difficulties of traveling across heavy ice which has been subjected to heavy pressures have frequently been described. When the sledge stops the dogs immediately lie down, and if they cannot start again, though pulling with all their strength, the leader frequently looks around pitifully, as if to say, We cannot do more!

Traveling with a light sledge and strong dogs is quite different. Then the team is almost unmanageable and as soon as it is hitched up it is off at full speed. The driver sits down on the fore part and lets the whip trail along, always ready for use. Now the dogs have time enough for playing and quarreling with one another. Though

they generally keep their proper place in the team, some will occasionally jump over the traces of their neighbors or crawl underneath them; thus the lines become quickly entangled, and it is necessary to clear them almost every hour.

If any dog of the team is lazy the driver calls out his name and he is lashed, but it is necessary to hit the dog called, for if another is struck he feels wronged and will turn upon the dog whose name has been called; the leader enters into the quarrel, and soon the whole pack is huddled up in one howling and biting mass, and no amount of lashing and beating will separate the fighting team. The only thing one can do is to wait until their wrath has abated and to clear the traces. It is necessary, however, to lay the mittens and the whip carefully upon the sledge, for the leader, being on the lookout for the traces to be strung, may give a start when the driver is scarcely ready, and off the team will go again before the driver can fairly get hold of the sledge. If anything has dropped from it he must drive in a wide circle to the same place before he can stop the team and pick it up. On an old track it is very difficult to stop them at all. When attempting to do so the driver digs his heels into the snow to obstruct their progress and eventually comes to a stop. Then he stands in front of the sled and makes the dogs lie down by lashing their heads gently. Should the dogs start off he would be thrown upon the sledge instead of being left behind, which might easily happen should he stand alongside.

The sledge is steered with the legs, usually with the right foot of the driver, or, if it must be pulled aside from a large hummock, by pulling the head aside or by means of the deer's antlers. If two persons are on the sledge — and usually two join for a long drive — they must not speak to each other, for as soon as the dogs hear them they will stop, turn around, sit down, and listen to the conversation. It has frequently been said that the method of harnessing is inconvenient, as the dogs cannot use their strength to the best advantage; but whoever has driven a sledge himself will understand that any other method would be even more troublesome and less effective. On smooth ice and hard snow any method of harnessing could be used; but, on rough ice, by any other method every cross piece would quickly break on attempting to cross the hummocks. Frequently the traces catch a projecting point and the dogs are then pulled back and thrown against the ice or under the sledge if the trace does not break. If for any reason a dog should hang back and the trace should trail over the snow the driver must lift it up to prevent it from being caught by the sledge runner, else the dog will be dragged in the same way as if the trace were caught by a hummock. Many dogs are able in such cases to strip off their harnesses and thus escape being dragged along, as the team cannot be stopped quickly enough to prevent this. Besides the driver must see to it that the dogs do

not step across their traces, which in such cases would run between their hind legs, for should this happen the skin might be severely chafed. If the driver sees a trace in this position he runs forward and puts it back without stopping the team. Particular attention must be paid to this matter when the dogs rise just before starting.

The sledges are not used until the ice is well covered with snow, as the salt crystals formed on the top of the ice in the autumn hurt the dogs' feet and cause sores that heal slowly. Late in the spring, when the snow has melted and sharp ice needles project everywhere, the feet of the dogs are covered with small pieces of leather, with holes for the nails, which are tied to the leg. As they are frequently lost and the putting on of these shoes takes a long time, their use is very inconvenient.

At this season numerous cracks run through the floe. They are either crossed on narrow snow bridges which join the edges at convenient places or on a drifting piece of ice by floating across.

A few more words in conclusion concerning the training of the dogs. The Eskimo rarely brings up more than three or four dogs at the same time. If the litter is larger than this number the rest are sold or given away. The young dogs are carefully nursed and in winter they are even allowed to lie on the couch or are hung up over the lamp in a piece of skin. When about four months old they are first put to the sledge and gradually become accustomed to pull along with the others. They undergo a good deal of lashing and whipping before they are as useful as the old ones.

If food is plentiful the dogs are fed every other day, and then their share is by no means a large one. In winter they are fed with the heads, entrails, bones, and skins of seals, and they are so voracious at this time of the year that nothing is secure from their appetite. Any kind of leather, particularly boots, harnesses, and thongs, is eaten whenever they can get at it. In the spring they are better fed and in the early part of summer they grow quite fat. In traveling, however, it sometimes happens at this time of the year, as well as in winter, that they have no food for five or six days. In Cumberland Sound, Hudson Strait, and Hudson Bay, where the rise and fall of the tide are considerable, they are carried in summer to small islands where they live upon what they can find upon the beach, clams, codfish, &c. If at liberty they are entirely able to provide for themselves. I remember two runaway dogs which had lived on their own account from April until August and then returned quite fat.

The Eskimo of all these regions are very much troubled with the well known dog's disease of the Arctic regions. The only places where it seems to be unknown are Davis Strait and Aggo. Here every man has a team of from six to twelve dogs, while in Cumberland Sound, in some winters, scarcely any have been left. (See Appendix, Note 2.)

HABITATIONS AND DRESS.

THE HOUSE.

The houses of the Eskimo differ according to the season. All the tribes from Smith Sound to Labrador and from Davis Strait to Victoria Land are in the habit of building snow houses in winter. Though they erect another more durable kind of winter house, these are more frequently in use. The principles of construction are the same everywhere. A level place is selected for erecting the snow house.

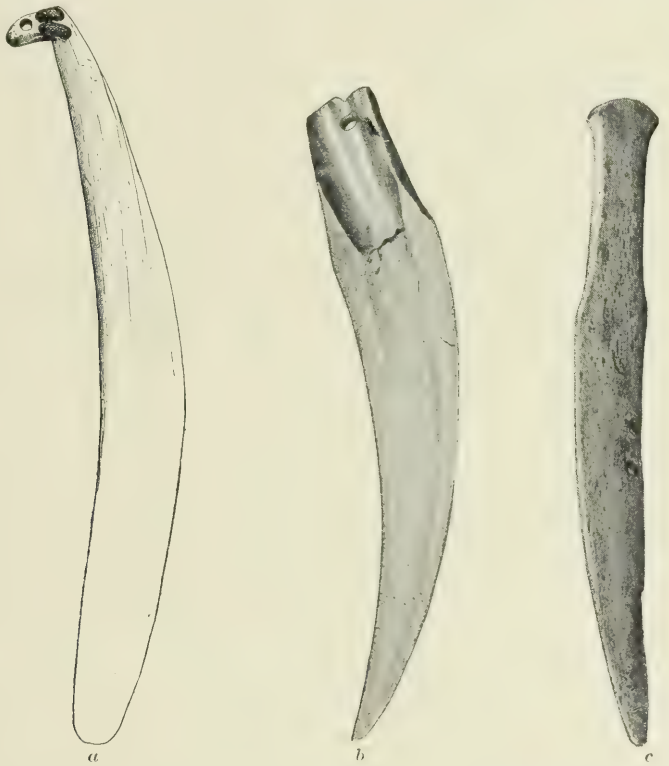


FIG. 490. Various styles of snow knife. (National Museum, Washington. *a*, 10386 ; *b*, 10385.)

To be suitable for cutting into blocks the snowbank must have been formed by a single storm, for blocks which are cut from drifts composed of several layers break when cut. It must be very fine grained, but not so hard that it cannot be readily cut with the saw or the snow knife. The whole building is constructed of blocks of about three feet or four feet in length, two feet in height, and from six inches to eight inches in thickness. They are cut with snow knives or dovetail saws, which for this reason are much in demand. The old snow knife (sulung) was made of ivory and had a slight curve (Fig. 490).

The blocks are cut either vertically or horizontally, the former way being more convenient if the snowdrift is deep. Two parallel cuts of the breadth and the depth of the blocks are made through the drift, and after having removed a small block the Eskimo go on cutting or sawing parallel to the surface. A cross cut is then made and the block is loosened with the point of the foot and lifted out of the bank. Vertical blocks are more easily detached from the snowdrift than horizontal ones.

Two men unite in building a house, the one cutting the blocks, the other building. At first a row of blocks is put up in a circle, the single pieces being slanted so as to fit closely together. Then the first block is cut down to the ground and the top of the row is slanted so as to form one thread of a spiral line. The builder places the first block of the second row with its narrow side upon the first block and pushes it with his left hand to the right so that it touches the last block of the first row. Thus the snow block, which is inclined a little inward, has a support on two sides. The vertical joint is slanted with the snow knife and tightly pressed together, the new block resting on the oblique side of the former. In building on in this way the blocks receive the shape of almost regular trapezoids. Every block is inclined a little more inward than the previous one, and as the angle to the vertical becomes greater the blocks are only kept in their places by the neighboring ones. In order to give them a good support the edges are the more slanted as their angle is greater.

This method of building is very ingenious, as it affords the possibility of building a vault without a scaffold. If the blocks were placed in parallel rows, the first block of a new row would have no support, while by this method each reclines on the previous one. When the house has reached a considerable height the man who cuts the blocks outside must place them upon the last row. The builder supports them with his head and pushes them to their proper places. The key block and those which are next to it are either cut inside or pushed into the house through a small door cut for the purpose. The key block is generally shaped irregularly, as it is fitted into the hole which remains; usually the last two blocks are triangular. When the vault is finished the joints between the blocks are closed up by cutting down the edges and pressing the scraps into the joints. Larger openings are closed with snow blocks and filled up with loose snow pressed into the fissures. Thus the whole building becomes a tight vault, without any holes through which the warm air inside may escape. Such a snow house, about five feet high and seven feet in diameter, is used as a camp in winter journeys. It takes about two hours for two skilled men to build and finish it. For winter quarters the vaults are built from ten to twelve feet high and twelve to fifteen feet in diameter. In order to reach this height the builder

makes a bench on which he steps while finishing the upper part of the building.

The plan of a snow house of the Davis Strait tribes is a little different from that of the Hudson Bay and the Iglulik tribes.

I shall first describe the former according to my own observations (Figs. 491 and 492).

The entrance to the main building is formed by two, or less frequently by three, small vaults. The first one (uadling) is a small dome about six feet in height, with a door two and a half feet in height; the second one is a long passage of equal height formed by an elliptical vault (igdluling). Its roof is generally arched, but sometimes the top is cut off evenly and covered with slabs of snow. Both vaults together form the entrance and are called toqsung. A door about three feet high leads into the main room, the floor of which is about nine inches above that of the former. Two very small vaults are always attached to the whole building (Fig. 491). One is situated alongside of the uadling and the igdluling, and serves as a storeroom for clothing and harness (sirdloang). It is not connected with the interior of the hut, but one of the blocks of the vault can be taken out and is made to serve as a lid. On the left side of the entrance of the main building is another small vault (igdluarn), which is accessible from the main building. It serves for keeping spare meat and blubber. Frequently there is a second igdluarn on the opposite side, and sometimes even a third one in the igdluling. Another appendix of the main building is frequently used, the audlitiving (Fig. 491 and Fig. 492 *c*). It is a vault similar to the sirdloang and is attached to the back of the main room. It serves for storing up meat for future use.

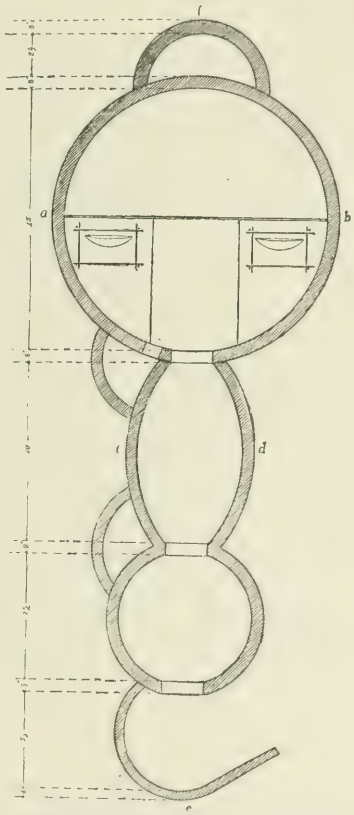


FIG. 491. Ground plan of snow house of Davis Strait tribes.

Directly over the entrance a window is cut through the wall, either square or more frequently forming an arch, which is generally covered with the intestines of ground seals, neatly sewed together, the

seams standing vertically (Fig. 493). In the center there is a hole (qingang) through which one can look out. In some instances a piece of fresh water ice is inserted in the hole. According to Ross it is always used by the Netchillirmiut (II, p. 250), who make the slab by letting water freeze in a sealskin.

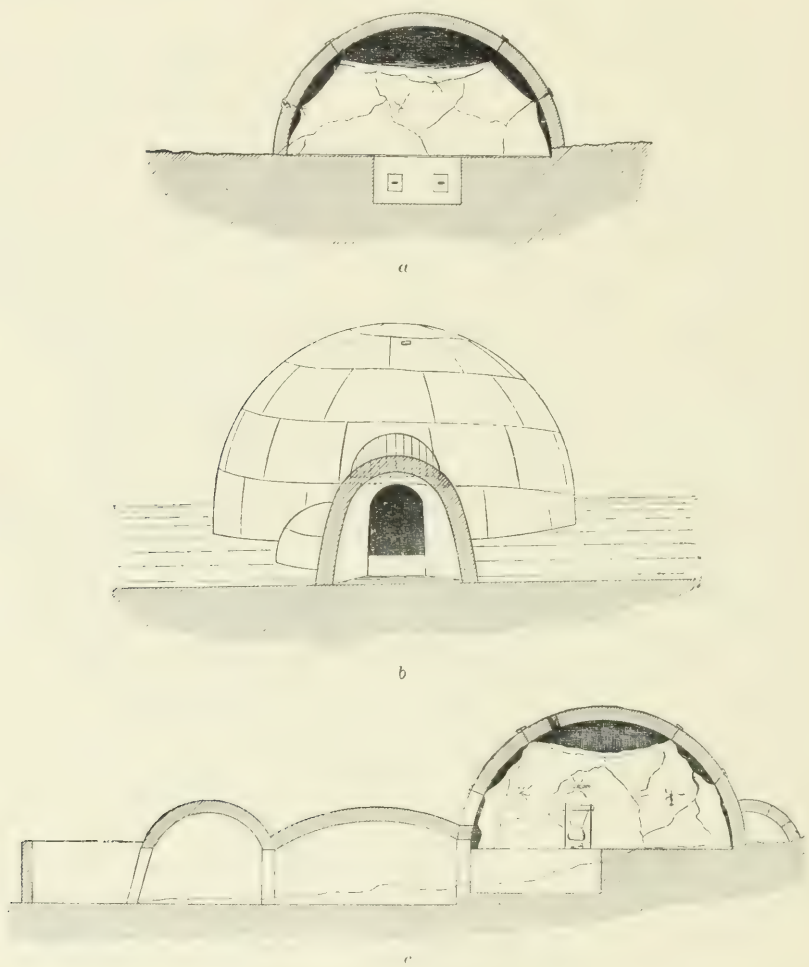


Fig. 492. Snow house of Davis Strait, sections.

In the rear half and on both sides of the door a bank of snow two and a half feet high is raised and cut off straight, a passage trench five feet wide and six feet long remaining. The rear half forms the bed; the adjoining parts of the side benches are the place for the lamps, while on both sides of the entrance meat and refuse are heaped up. Frequently the snowbank on which the hut is built is deep

enough so that the bed needs very little raising, and the passage is cut into the bank. As this is much more convenient in building, the huts are generally erected on a sloping face, the entrance lying on the lower part, which faces the beach.

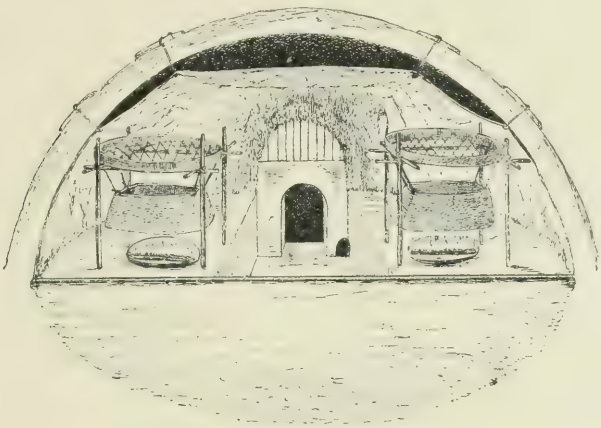


FIG. 493. Section and interior of snow house.

Before the bed is arranged and the hut furnished the vault is lined with skins, frequently with the cover of the summer hut. The lining (ilupiqang) is fastened to the roof by small ropes (nirtsun), which are fastened by a toggle on the outside of the wall (Fig. 493). In the lower part of the building the lining lies close to the wall; in the upper part it forms a flat roof about two or three feet below the top of the vault. The effect of this arrangement is to prevent the warm air inside from melting the snow roof, as above the skins there is always a layer of colder air. Close to the top of the building a small hole (qangirn) is cut through the wall for ventilation. The lamps require a good draught, which is secured by this hole. The cold air enters through the door, slowly filling the passage, and after being warmed rises to the lamps and escapes through the skin cover and the hole. The moisture of the air forms long ice needles on the inside of the roof. Sometimes they fall down upon the skins, and must be immediately removed by shaking it until they glide down at the sides, else they melt and wet the room thoroughly. Frequently a high ice funnel forms around the hole from the freezing moisture of the escaping air.

The southern and western tribes rarely line the snow house. The continuous dropping from the roof, however, causes great inconvenience, and, besides, the temperature cannot be raised higher than two or three degrees centigrade above the freezing point, while in the lined houses it is frequently from ten to twenty degrees centi-

grade, so that the latter are much more comfortable. To avoid the dropping the natives apply a cold piece of snow to the roof before the drop falls down, which at once freezes to it, the roof acquiring by this repeated process a stalactitic appearance. The eastern tribes use the lining in their permanent houses without any exception. The western and southern tribes, who leave the walls bare, heap a thick layer of loose snow over the whole building, almost covering it up, the window and the ventilating hole alone excepted. For this purpose snow shovels are used.

The edge of the bed is formed by a long pole. The surface of the snowbank which forms the foundation for the bed is covered with pieces of wood, oars, paddles, tent poles, &c. These are covered with a thick layer of shrubs, particularly *Andromeda tetragona*. Over these numerous heavy deerskins are spread, and thus a very comfortable bed is made.

According to Parry the arrangement in Iglulik is as follows (II, p. 501):

> The beds are arranged by first covering the snow with a quantity of small stones, over which are laid their paddles, tent poles, and some blades of whalebone; above these they place a number of little pieces of network made of thin slips of whalebone, and lastly a quantity of twigs of birch and of the *Andromeda tetragona*. * * * The birch, they say, had been procured from the southward by way of Nuvuk. * * * There deerskins, which are very numerous, can now be spread without risk of their touching the snow.

At night, when the Eskimo go to bed, they put their clothing, their boots excepted, on the edge of the platform under the deerskins, thus forming a pillow, and lie down with the head toward the entrance. The blankets (qipiq) for their beds are made of heavy deerskins, which are sewed together, one blanket serving for a whole family. The edge of the blanket is trimmed with leather straps.

On the side benches in front of the bed is the fireplace, which consists of a stone lamp and a framework from which the pots are suspended (see Fig. 493). The lamp (qudlirn), which is made of soapstone, is a shallow vessel in the shape of a small segment of a circle. Sometimes a small space is divided off at the back for gathering in the scraps of blubber. The wick consists of hair of *Eryophorum* or of dried moss rubbed down with a little blubber so as to be inflammable. It is always carried by the women in a small bag. The whole vessel is filled with blubber as high as the wick, which is spread along the straight side of the vessel. It requires constant attention to keep the desired length burning without smoking, the length kindled being in accordance with the heat or light required. The trimming of the wick is done with a bit of bone, asbestus, or wood, with which the burning moss is spread along the edge of the lamp and extinguished or pressed down if the fire is not wanted or if it smokes. At the same time this stick serves to light other lamps (or pipes), the burnt point

being put into the blubber and then kindled. Sometimes a long, narrow vessel stands below the lamp, in which the oil that drops from the edge is collected.

In winter the blubber before being used is frozen, after which it is thoroughly beaten. This bursts the vesicles of fat and the oil comes out as soon as it is melted. The pieces of blubber are either put into the lamp or placed over a piece of bone or wood, which hangs from the framework a little behind the wick. In summer the oil must be chewed out. It is a disgusting sight to see the women and children sitting around a large vessel all chewing blubber and spitting the oil into it.

The frame of the fireplace consists of four poles stuck in the snow in a square around the lamp and four crossbars connecting the poles at the top. From those which run from the front to the back the kettle (ukusik) is suspended by two pairs of strings or thongs. It is made of soapstone and has a hole in each corner for the string. The kettle which is in use among the eastern tribes has a narrow rim and a wide bottom (Fig. 494), while that of the western ones is just the opposite. Parry, however, found one of this description in River Clyde (I, p. 286). When not in use it is shoved back by means of the strings. Since whalers began to visit the country a great number of tin pots have been introduced, which are much more serviceable, the process of cooking being quickened.

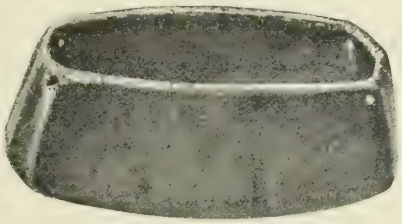


FIG. 494. Ukusik or soapstone kettle.

On the top of the frame there is always a wood or bone hoop with a net of thongs stretched across it (inetang). It serves to dry clothing, particularly boots, stockings, and mittens, over the fire. In the passage near the entrance to the hut there is frequently a small lamp (adlirn), which is very effective for warming the cold air entering through the door, and in the remotest corner in the back of the hut there is sometimes another (kidlulirn). When all the lamps are lighted the house becomes warm and comfortable.

Two small holes are frequently cut in the snowbank which forms the ledge, at about the middle of its height (see Fig. 492 *a*). They are closed with small snow blocks, each of which has a groove for a handle, and serve to store away anything that must be kept dry.

At night the entrance of the inner room is closed with a large snow block, which stands in the passage during the day.

These huts are always occupied by two families, each woman having her own lamp and sitting on the ledge in front of it, the one on the right side, the other on the left side of the house. If more families join in building a common snow house, they make two main rooms with one entrance. The plan of such a building is seen in Fig. 495.

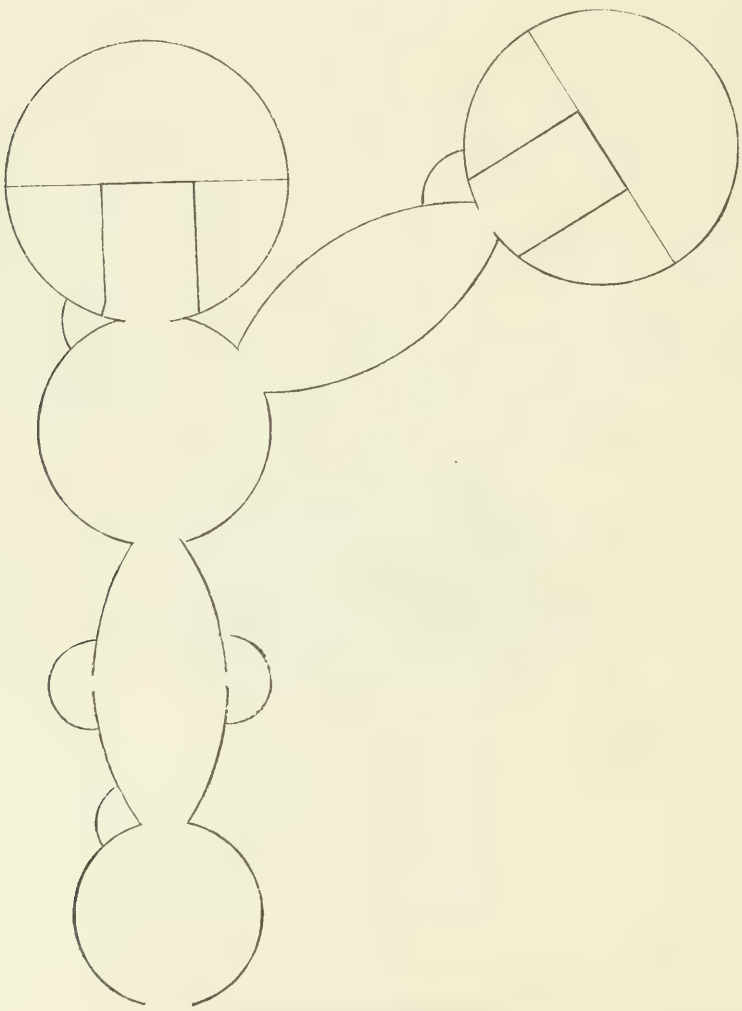


Fig. 495. Plan of double snow house.

The plans of the Iglulik and Hudson Bay houses are different from the one described here. The difference will best be seen by comparing the plans represented in Fig. 496 and Fig. 497, which have been

reprinted from Hall and Parry, respectively, with the former ones. Among the eastern tribes I have never seen the beds on the side of the passage, but always at the rear of the house.

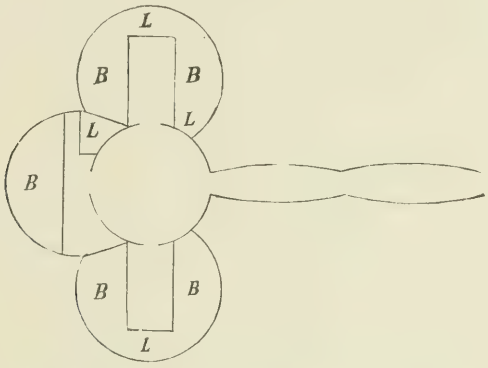


FIG. 496. Plan of Iglulik house. (From Parry II, p. 500.)

Besides these snow houses a more solid building is in use, called qarmang. On the islands of the American Archipelago and in the neighboring parts of the mainland numerous old stone foundations are found, which prove that all these islands were once inhabited by the Eskimo. It has often been said that the central tribes have forgotten the art of building stone houses and always live in snow huts.

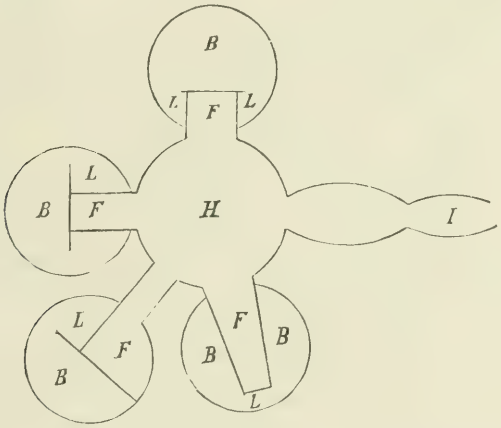


FIG. 497. Plan of Hudson Bay house. (From Hall II, p. 128.)

At the present time they do not build houses, but cover the walls of an old hut with a new roof whenever they take possession of it. There is no need of any new buildings, as the Eskimo always locate in the old settlements and the old buildings are quite sufficient to satisfy all their wants.

Those in good condition have a long stone entrance (ka'teng) (Fig. 498), sometimes from fifteen to twenty feet long. This is made by cutting an excavation into the slope of a hill. Its walls are covered with large slabs of stone about two and a half feet high and three feet wide, the space between the stone and the sides of the excava-

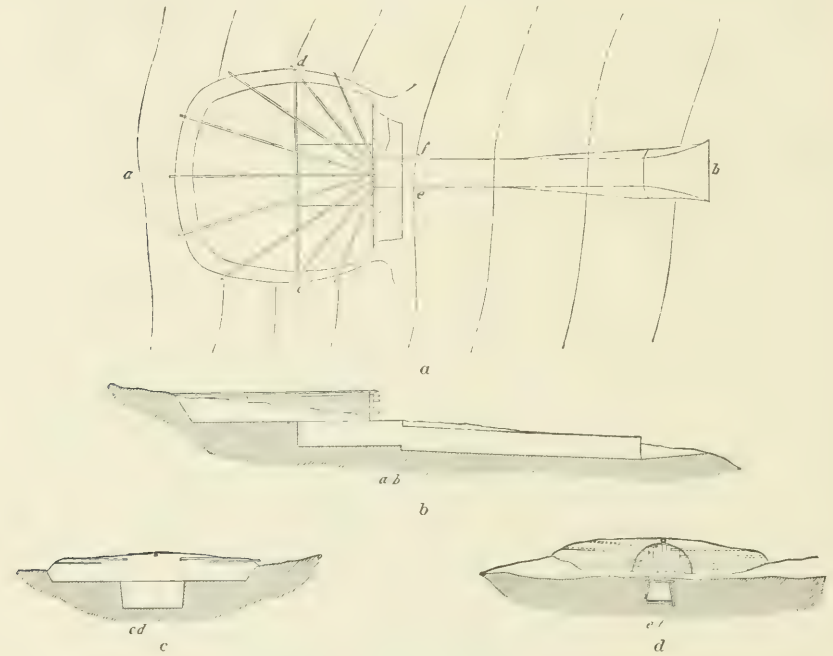


FIG. 498. Plan and sections of qarmang or stone house.

tion being afterwards filled up with earth. The floor of the passage slopes upward toward the hut. The last four feet of the entrance are covered with a very large slab and are a little higher than the other parts of the roof of the passageway. The slab is at the same height as the benches of the dwelling room, which is also dug out, the walls being formed of stones and whale ribs. The plan of the interior is the same as that of the snow house, the bed being in the rear end of the room and the lamps on both sides of the entrance. The floor of the hut is about eight inches higher than that of the passage. The roof and the window, however, differ from those of the snow house. In the front part of the hut the rib of a whale is put up, forming an arch. A great number of poles are lashed to it and run toward the back of the house, where they rest on the top of the wall, forming, as it were, the rafters. The whole curve formed by the rib is covered with a window of seal intestines, while the poles are covered with sealskins, which are fastened in front to the whale rib. At the other end they are either fastened

to the ribs in the wall or, more frequently, are steadied by stones The roof is covered with a thick layer of *Andromeda*, and another skin, which is fastened in the same way, is spread over both covers. This kind of hut is very warm, light, and comfortable. The stone banks forming the bed are covered as already described.

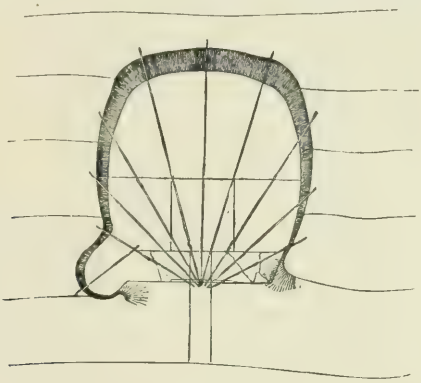


FIG. 499. Plan of large qarmang or stone house for three families.

If three families occupy one house the whale's rib which forms the window is placed a few feet farther forward than in the previous case, at the end of the large slab which forms the roof of the last part of the passage.

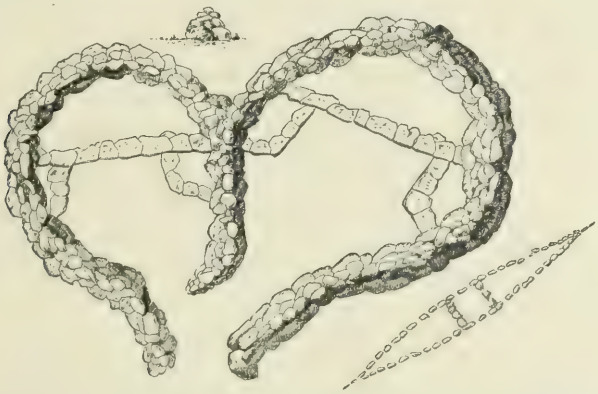


FIG. 500. Plan of stone house in Anarnitung, Cumberland Sound. (From a drawing by L. Kumlien.

By means of poles and bones a small side room is built (qareang), the ceiling of which is sewed to that of the main room (Fig. 499). The large slab which is in front of the window (at the end of the passage) is utilized as a storeroom for both families living on that side of the house, a place being left open only in the middle, where the spy hole is. In some instances this side room is inclosed in the stone walls of the hut.

Fig. 500 and Fig. 501 present sketches of plans of some of these

houses. From such sketches it appears that several houses might have a common entrance.

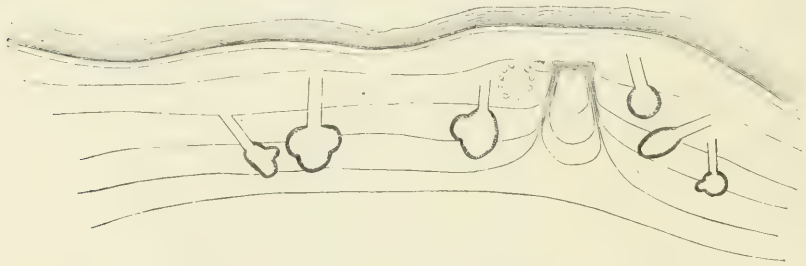
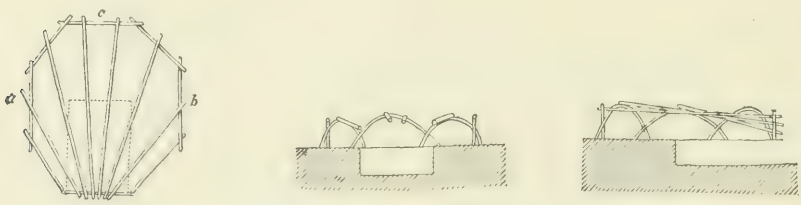


FIG. 501. Plan of group of stone houses in Pangnirtung, Cumberland Sound.

In Anarnitung I observed no passage at all for the houses, the walls being entirely above the ground and piled up with bowlders and sod. They are, however, covered in the same way as the others and the entrance is made of snow.



d *ab* *cd*

FIG. 502. Plan and sections of qarmang or house made of whale ribs.

A winter house built on the same plan is represented in Fig. 502. The wall is made entirely of whale ribs, placed so that their ends cross one another. The poles are tied over the top of the ribs and the whole frame is covered with the double roof described above. A few narrow snow vaults form the entrance. The front rib forms the door, and thus the hut becomes quite dark. Huts of this kind are also called qarmang or qarmaujang, i. e., similar to a qarmang.

In Ukiadliving I found, along with a great number of fine qarmat, some very remarkable storehouses, such as are represented in Fig. 503. Structures of this kind (ikan′) consist of heavy granite pillars, on the top of which flat slabs are piled to a height of from nine to ten feet. In winter, blubber and meat are put away upon these pillars, which are sufficiently high to keep them from the dogs. Sometimes two pillars, about ten feet apart, are found near the huts. In winter the kayak is placed upon them in order to prevent it from being covered by snowdrifts or from being torn and destroyed by the dogs. In snow villages these pillars are made of snow.

The purpose of the long, kayak-like building figured by Kumlien (see Fig. 500) is unknown to me. I found a similar one, consisting of two rows of stones, scarcely one foot high but twenty feet long,

in Pangnirtung, Cumberland Sound, but nobody could explain its use.

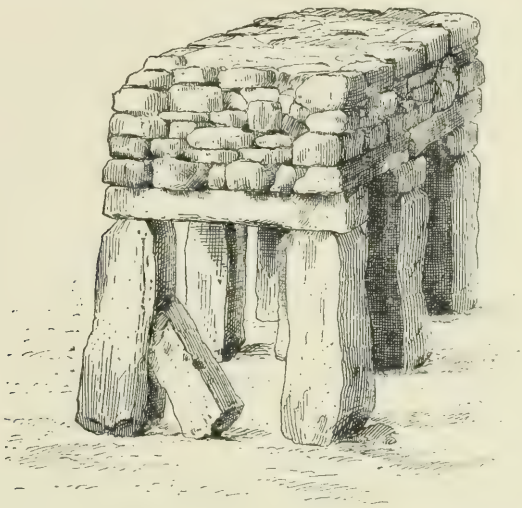


FIG. 503. Storehouse in Ukiadliving. (From a sketch by the author.)

In the spring, when the rays of the sun become warmer, the roofs of the snow houses fall down. At this season the natives build only the lower half of a snow vault, which is covered with skins.

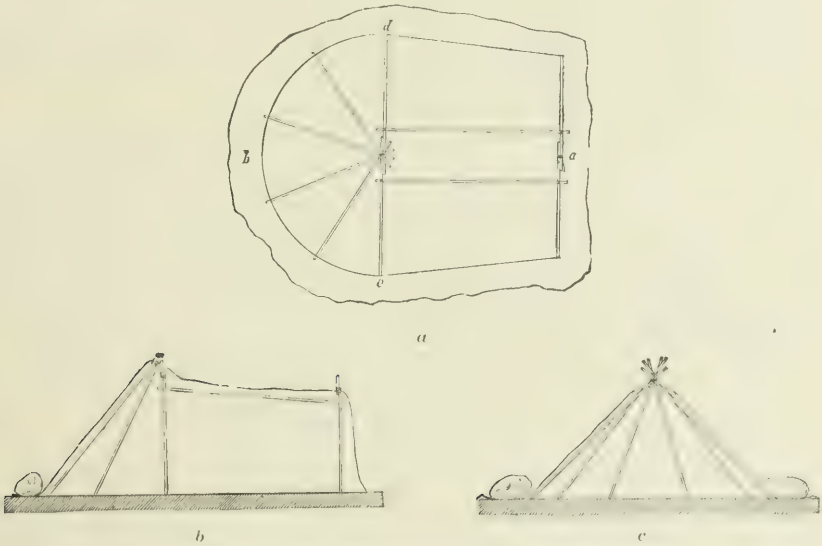


FIG. 504. Plan and sections of tupiq or tent of Cumberland Sound.

Still later they live in their tents (tupiq) (Fig. 504). The framework consists of poles, which are frequently made of many pieces of wood ingeniously lashed together. The plan (Fig. 504 *a*) is the same

as that of the winter houses. At the edge of the bed and at the entrance two pairs of converging poles are erected. A little below the crossing points two cross strips are firmly attached, forming the ridge. Behind the poles, at the edge of the bed, six or eight others are arranged in a semicircle resting on the ground and on the crossing point of those poles. The frame is covered with a large skin roof fitting tightly. The back part, covering the bed, is made of sealskins; the fore part, between the two pairs of poles, of the thin membrane which is split from the skins (see p. 519), and admits the light. The door is formed by the front part of the cover, the left side (in entering) ending in the middle of the entrance, the right one overlapping it, so as to prevent the wind from blowing into the hut. The cover is steadied with heavy stones (Fig. 504 *c*). In Cumberland Sound and the more southern parts of Baffin Land the back of the hut is inclined at an angle of 45°; in Davis Strait it is as steep as 60°, or even more. In the summer tent the bed and the side platforms are not raised, but only separated from the passage by means of poles.

Farther north and west, in Pond Bay, Admiralty Inlet, and Iglulik, where wood is scarce, the Eskimo have a different plan of construction (Fig. 505). A strong pole is set up vertically at the end of the passage, a small cross piece being lashed to its top. The entrance is formed by an oblique pole, the end of which lies in the ridge of the roof. The latter is formed by a stout thong which runs over the top of both poles and is fastened to heavy stones on both sides. If wood is wanting, then poles are made from the penis bones of the walrus. Parry found one of these tents at River Clyde, on his first expedition, and describes it as follows (I, p. 283):

> The tents which compose their summer habitations, are principally supported by a long pole of whalebone, 14 feet high, standing perpendicularly, with 4 or 5 feet of it projecting above the skins which form the roof and sides. The length of the tent is 17, and its breadth from 7 to 9 feet, the narrowest part being next the door, and widening towards the inner part, where the bed, composed of a quantity of the small shrubby plant, the *Andromeda tetragona*, occupies about one-third of the whole apartment. The pole of the tent is fixed where the bed commences, and the latter is kept separate by some pieces of bone laid across the tent from side to side. The door which faces the southwest, is also formed of two pieces of bone, with the upper ends fastened together, and the skins are made to overlap in that part of the tent, which is much lower than the inner end. The covering is fastened to the ground by curved pieces of bone, being generally parts of the whale.

This kind of tent differs from the one described by me only in the construction of its door.

I could not find a description of the tent of the Hudson Bay Eskimo. There is only one illustration in Klutschak (p. 137) and one in Ross (II, p. 581) representing tents of the Netchillirmiut. In the former there are a few conical tents, such as are used by the eastern tribes before a sufficient number of skins for a large tent can be

procured. The same kind is represented in Ross's book. The other tent drawn by Klutschak is similar to the Iglulik one, but the arrangement of the poles in the back part is invisible. The entrance is formed by two converging poles and a rope runs over the ridge and is tied to a rock.

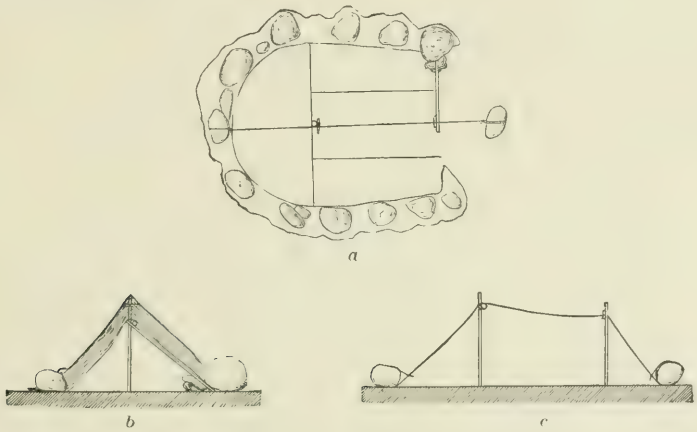


FIG 505. Plan and sections of tupiq or tent of Pond Bay.

The small tents which are used in the spring are made of a few converging poles forming a cone. They are covered with a skin roof.

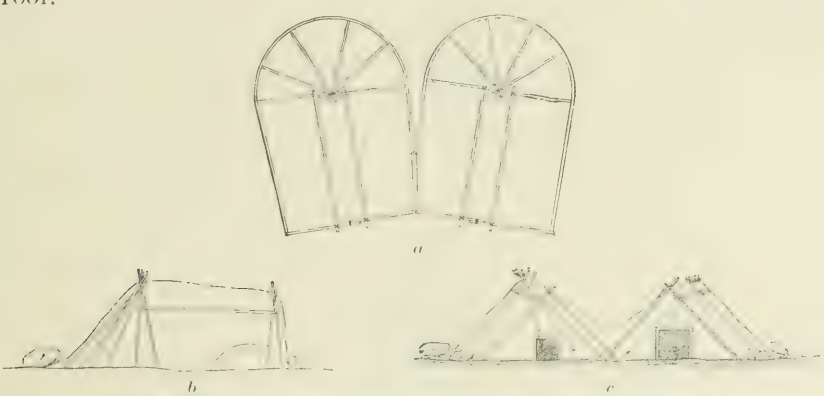


FIG. 506. Plan and sections of double winter tent, Cumberland Sound.

Some families, instead of building snow houses or stone houses in winter, cover the summer tent with shrubs and spread over them a second skin cover. In front of the tent snow vaults are built to protect the interior from the cold. In some instances several families join their tents (Fig. 506). In the front part where the tents adjoin each other the covers are taken away and replaced by a whale rib which affords a passage from one room to the other.

The plans of the feasting houses will be found in another place (p. 600).

CLOTHING, DRESSING OF THE HAIR, AND TATTOOING.

The styles of clothing differ among the tribes of the Central Eskimo. In summer the outer garment is always made of sealskins, though the women wear deerskins almost the entire year. The sealskin clothing is made from the skins of *Pagomys fœtidus*, yearlings being used, and also from those of *Callocephalus*, if they can be obtained. The latter particularly are highly valued by the natives. The inner garment is made either of the skin of the young seal in the white coat or of a light deerskin. It is cut entirely with the woman's knife and is sewed with deer sinews.

The prettiest clothing is made by the tribes of Davis Strait. Both men and women wear boots, trousers, and jackets. The style of the men's clothing may be seen from Figs. 397 and 399, which represent men in the winter clothing, and 412 and 435, which show them in summer clothing. The summer boots are made from the hairless skin of *Pagomys fœtidus*, the soles from that of *Phoca*, the sole reaching to the top of the foot. The leg of the boot is kept up by a string passing through its rim and firmly tied around the leg. At the ankle a string passes over the instep and around the foot to prevent the heel from slipping down. On the top of the foot a knob (qaturang) is sometimes attached to the string as an ornament (Fig. 507). The stocking is made of light deerskin. It reaches above the knee, where it has a trimming made from the white parts of a deerskin, whereas the boot ends below the knee. Next to the stocking is a slipper, which is made of birdskin, the feathers being worn next to the foot. This is covered with a slipper of sealskin, the hair side worn outward and the hair pointing toward the heel. The boot finishes the footgear. In the huts the birdskin slippers are frequently laid aside.

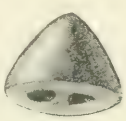


FIG. 507. Qaturang or boot ornament. (Museum für Völkerkunde, Berlin. IV A 6850.

The breeches of the men consist of an outside and an inside pair, the former being worn with the hair outside; the latter, which are made of the skins of young seals or of deer, with the hair inside. They are fastened round the body by means of a string and reach a little below the knee. Their make will best be seen from the figures. Only the southern tribes trim the lower end of the trousers by sewing a piece to them, the hair of which runs around the leg, while above it runs downward. This pattern looks very pretty.

The jacket does not open in front, but is drawn over the head. It

has a hood fitting closely to the head. The back and the front are made of a sealskin each. The hood of the Oqomiut is sharply pointed, while that of the Akudnirmiut is more rounded. The jackets are cut straight and have a slit in front. Some have a short tail behind, particularly the winter jackets. The cut of the winter clothing, which

FIG. 508. Woman's jacket. (National Museum, Washington.)

is made of deerskin, is the same as the former, and it is frequently trimmed with straps of deerskin. The jacket is rarely worn with the hood down, as it is only used while hunting and traveling. It is

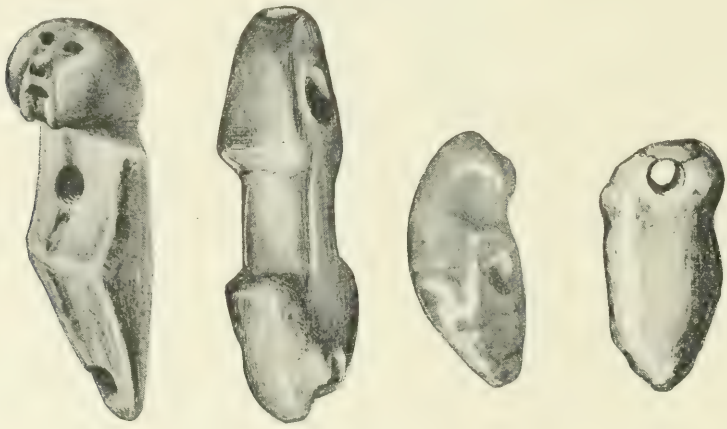
a *b* *c*

FIG. 509. Ivory beads for women's jackets. *a* (Museum für Völkerkunde, Berlin. IV A 6841.) *b*, *c* (National Museum, Washington. 34134.)

never brought into the huts, but after being cleaned from the adhering snow with the snowbeater (tiluqtung, as named by the eastern

tribes; arautaq, as called by Hudson Bay tribes) is kept in the storeroom outside the house.

The women's trousers are composed of two pieces. The upper one fits tightly and covers the upper half of the thigh. It is made of the skin of a deer's belly. The other parts are, as it were, leggings, which reach from a little below the knee to the middle of the thigh and are kept in place by a string running to the upper part of the trousers. The women's jacket (Fig. 508) is much more neatly trimmed than that of the men. It is frequently adorned with ivory or brass beads running round the edge (Fig. 509). It has a wide and large hood reaching down almost to the middle of the body. In front the jacket has a short appendage; behind, a very long tail which trails along the ground (see Fig. 508). If a child is carried in the hood, a leather girdle fastened with a buckle (Fig. 510) is tied around the waist and serves to prevent the child from slipping down. The first specimen given in Fig. 510 is remarkable for its artistic design.



a *b* *c* *d*

FIG. 510. Girdle buckles. *a*, *c*, *d* (Museum für Völkerkunde, Berlin.) *b* (National Museum, Washington. 34125.) $\frac{1}{1}$

Among the Akudnirmiut of Davis Strait another fashion is more frequently in use much resembling that of Iglulik. The women have a wider jacket with a broader hood, enormous boots with a flap reaching up to the hip, and breeches consisting of one piece and reaching to the knees. Unfortunately I have no drawing of this clothing and must therefore refer to Parry's engravings, which, however, are not very well executed, and to the figures representing dolls in this costume (see Fig. 528).

When children are about a month old they are put into a jacket made from the skin of a deer fawn and a cap of the same material, their legs remaining bare, as they are always carried in their mother's

hood. In some places, where large boots are in use, they are said to be carried in these. The cap is separate and is always made of the head of a fawn, the ears standing upright on each side of the head. The jacket is either quite open in front or has a short slit. Children of more than two years of age wear the same clothing, with trousers and boots (Fig. 511). When they are about eight years old they are clothed like men (Fig. 512). Girls frequently wear the same kind of dress for some time, until they are from nine to ten years old, when they assume the clothing of the women.

FIG. 511. Infant's clothing. (Museum für Völkerkunde, Berlin.)

FIG. 512. Child's clothing.

As to the mode of clothing of the other tribes I give the descriptions of the authors.

Parry describes the dress of the Iglulirmiut as follows (II, p. 495):

In the jacket of the women, the tail or flap behind is very broad, and so long as almost to touch the ground; while a shorter and narrower one before reaches halfway down the thigh. The men have also a tail in the hind part of their jacket, but of smaller dimensions; but before, it is generally straight or ornamented by a single scollop. The hood of the jacket * * * is much the largest in that of the women, for the purpose of holding a child. The back of the jacket also bulges out in the middle to give the child a footing, and a strap or girdle below this, and secured round the waist by two large wooden buttons in front, prevents the infant from falling through when, the hood being in use, it is necessary thus to deposit it. * * * The upper (winter) garment of the females, besides being cut according to a regular

and uniform pattern, and sewed with exceeding neatness, which is the case with all the dresses of these people, has also the flaps ornamented in a very becoming manner by a neat border of deerskin, so arranged as to display alternate breadths of white and dark fur. This is, moreover, usually beautified by a handsome fringe, consisting of innumerable long, narrow threads of leather hanging down from it. This ornament is not uncommon also in the outer jackets of the men. When seal-hunting, they fasten up the tails of their jackets with a button behind.

The breeches and the foot gear of the men are described as being much the same as those of the Akudnirmiut. Parry remarks (loc. cit.) that several serpentine pieces of hide are sewed across the soles to prevent them from wearing out:

The inner boot of the women, unlike that of the men, is loose around the leg, coming as high as the knee joint behind, and in front carried up by a long, pointed flap nearly to the waist and there fastened to the breeches. The upper boot, with the hair as usual outside, corresponds with the other in shape, except that it is much more full, especially on the outer side, where it bulges out so preposterously as to give the women the most awkward, bow-legged appearance imaginable. * * * Here, also, as in the jacket, considerable taste is displayed in the selection of different parts of the deerskin, alternate strips of dark and white being placed up and down the sides and front by way of ornament. The women also wear a moccasin (itigega) overall in the winter-time.

The dress of the Aivillirmiut is similar to that of the Iglulirmiut (Gilder, p. 139).

Traces of clothing found in old graves of Cumberland Sound and Frobisher's description of the dress of the Nugumiut show that the style of clothing now used by the Iglulirmiut formerly obtained in all parts of Baffin Land.

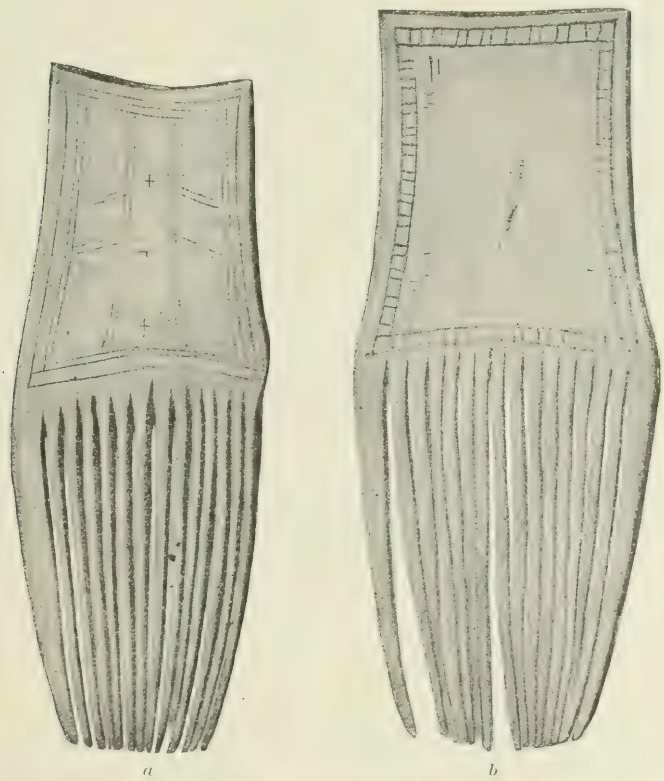
All the Eskimo wear mittens. Those used in winter are made of the skin of young seals or of deerskin. In summer they use hairless sealskin, and sometimes make them with two thumbs, so as to turn the mitten round if one side should become wet.

The manner of dressing the hair practiced by the tribes of Northeastern Baffin Land differs from that of other tribes. On Davis Strait and in Hudson Bay the men allow it to grow to a considerable length, but frequently cut it short on the forehead. If all the hair is long it is kept back by a band made of the skin of deer antlers taken in the velvet. Sometimes these ties are very neatly finished. Frobisher states that the Nugumiut shaved part of their heads. The Kinipetu shave the top of the head; the Netchillirmiut wear their hair short.

The women have two styles of dressing their hair. They always part it on the top of the head. The back hair is wound into a bunch protruding from the back of the head or nicely arranged in a knot. The hair at the sides is plaited and folded over the ears, joining the knot behind. The other way is to arrange these parts in small pigtails reaching a little below the ears. They are kept in order by an ivory or brass ring (see Fig. 515).

The manner in which the Iglulirmiut dress their hair is thus described by Parry (II, p. 493):

They separate their locks into two equal parts, one of which hangs on each side of their heads and in front of their shoulders. To stiffen and bind these they use a narrow strap of deerskin, attached at one end to a round piece of bone, fourteen inches long, tapered to a point, and covered over with leather. This looks like a little whip, the handle of which is placed up and down the hair and the strap wound round it in a number of spiral turns, making the tail, thus equipped, very much resemble one of those formerly worn by our seamen. The strap of this article of dress, which is altogether called a tugliga, is so made from the deerskin as to show when bound round the hair, alternate turns of white and dark fur, which give it a very neat and ornamental appearance. * * * Those who are less nice dispose * * * their hair into a loose plait on each side or have one tugliga and one plait.



a *b*

FIG. 513. Ivory combs. (National Museum, Washington. 10195.)

The natives of Southampton Island arrange their hair in a bunch protruding from the forehead (sulubaut). The same dress is worn at certain feasts on Davis Strait (p. 608).

For dressing the hair ivory combs are in use, two specimens of which are represented in Fig. 513.

The clothing is frequently trimmed with straps of white deerskin,

giving it a pleasing appearance. The edge of the women's jacket is adorned with ivory beads. Instead of these, teeth, deer's ears, foxes' noses, or brass bells are sometimes used.

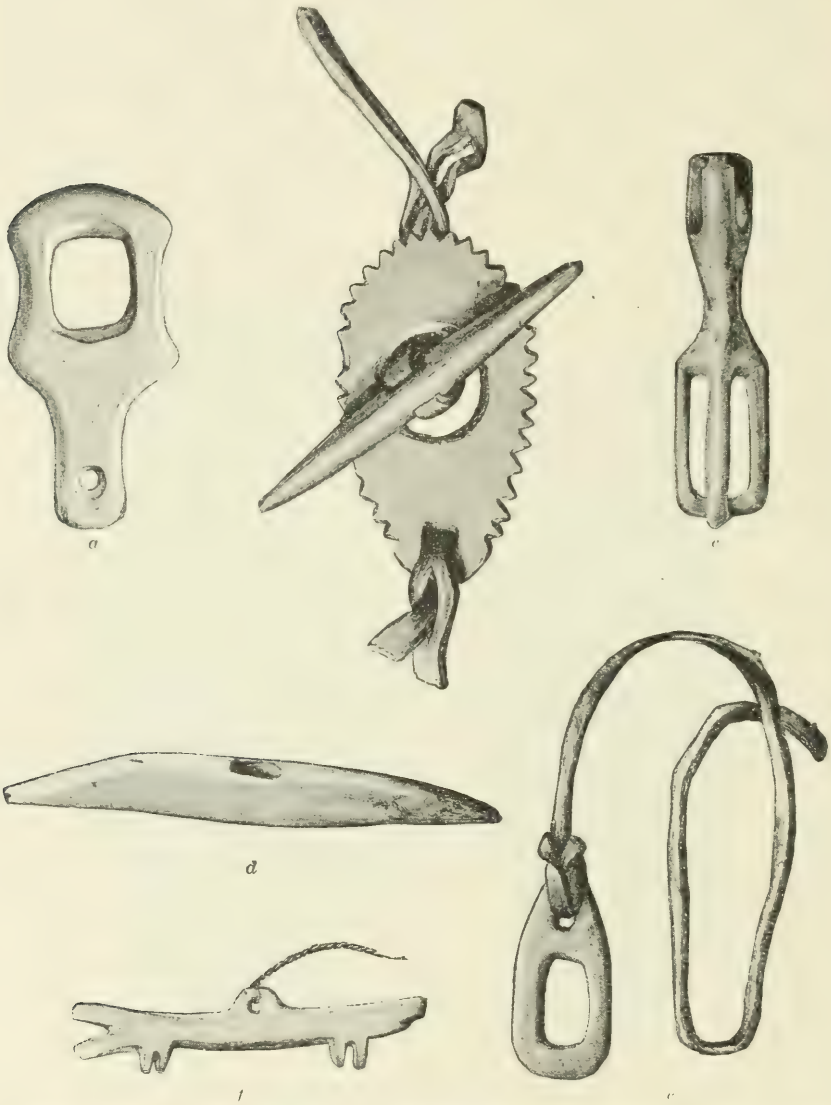


FIG. 514. Buckles. *c* (From Tununirmiusirn.) (National Museum, Washington. *a*, 10196; *b*, 10400; *c*, 10177; *d*, 10196; *e*, 10195; *f*, 10207.) ¾

The inner jackets of the men are sometimes trimmed with beads, feathers, or leather straps, forming a collar and figures of different kinds on the back and on the breast. An amulet is worn in the middle of the back (p. 592). These ornaments and the amulet are only visible when the outer garment is taken off in the hut.

Fig. 514 represents a number of buckles serving to carry needle-cases or similar implements at the girdle, to which the eye is tied, the button being fastened to the implement. Head ornaments are in frequent use and are sometimes beautifully finished.

FIG. 515. Manner of tattooing face and wearing hair.

The women are in the habit of adorning their faces by tattooing. It is done, when they are about twelve years of age, by passing needle and thread covered with soot under the skin, or by puncture, the points of the tattooing instruments being rubbed with the same substance in both cases, which is a mixture of the juice of *Fucus* and soot, or with gunpowder, by which process they obtain a blue color. The face, arms, hands, thighs, and breasts are the parts of the body which are generally tattooed. The patterns will be seen in Figs. 515 and 516.

FIG. 516. Manner of tattooing legs and hands.

SOCIAL AND RELIGIOUS LIFE.

DOMESTIC OCCUPATIONS AND AMUSEMENTS.

It is winter and the natives are established in their warm snow houses. At this time of the year it is necessary to make use of the short daylight and twilight for hunting. Long before the day begins to dawn the Eskimo prepares for hunting. He rouses his housemates; his wife supplies the lamp with a new wick and fresh blub-

ber and the dim light which has been kept burning during the night quickly brightens up and warms the hut. While the woman is busy preparing breakfast the man fits up his sledge for hunting. He takes the snow block which closes the entrance of the dwelling room during the night out of the doorway and passes through the low passages. Within the passage the dogs are sleeping, tired by the fatigues of the day before. Though their long, heavy hair protects them from the severe cold of the Arctic winter, they like to seek shelter from the piercing winds in the entrance of the hut.

The sledge is iced, the harnesses are taken out of the storeroom by the door, and the dogs are harnessed to the sledge. Breakfast is now ready and after having taken a hearty meal of seal soup and frozen and cooked seal meat the hunter lashes the spear that stands outside of the hut upon the sledge, hangs the harpoon line, some toggles, and his knife over the antlers, and starts for the hunting ground. Here he waits patiently for the blowing seal, sometimes until late in the evening.

Meanwhile the women, who stay at home, are engaged in their domestic occupations, mending boots and making new clothing, or they visit one another, taking some work with them, or pass their time with games or in playing with the children. While sitting at their sewing and at the same time watching their lamps and cooking the meat, they incessantly hum their favorite tunes. About noon they cook their dinner and usually prepare at the same time the meal for the returning hunters. As soon as the first sledge is heard approaching, the pots, which have been pushed back during the afternoon, are placed over the fire, and when the hungry men enter the hut their dinner is ready. While hunting they usually open the seals caught early in the morning, to take out a piece of the flesh or liver, which they eat raw, for lunch. The cut is then temporarily fastened until the final dressing of the animal at home.

In the western regions particularly the hunters frequently visit the depots of venison made in the fall, and the return is always followed by a great feast.

After the hunters reach home they first unharness their dogs and unstring the traces, which are carefully arranged, coiled up, and put away in the storeroom. Then the sledge is unloaded and the spoils are dragged through the entrance into the hut. A religious custom commands the women to leave off working, and not until the seal is cut up are they allowed to resume their sewing and the preparing of skins. This custom is founded on the tradition that all kinds of sea animals have risen from the fingers of their supreme goddess, who must be propitiated after being offended by the murder of her offspring (see p. 583). The spear is stuck into the snow at the entrance of the house, the sledge is turned upside down, and the ice coating is removed from the runners. Then it is leaned against the

wall of the house, and at last the hunter is ready to enter. He strips off his deerskin jacket and slips into his sealskin coat. The former is carefully cleaned of the adhering ice and snow with the snowbeater and put into the storeroom outside the house.

This done, the men are ready for their dinner, of which the women do not partake. In winter the staple food of the Eskimo is boiled seal and walrus meat, though in some parts of the western districts it is musk ox and venison, a rich and nourishing soup being obtained by cooking the meat. The natives are particularly fond of seal and walrus soup, which is made by mixing and boiling water, blood, and blubber with large pieces of meat.

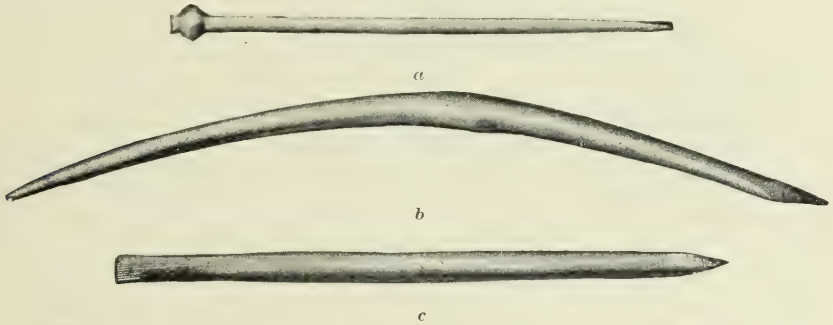


FIG. 517. Forks. *a*, *b* (From Iglulik.) (National Museum, Washington. *a*, 10395; *b*, 10393.)

The food is not always salted, but sometimes melted sea water ice, which contains a sufficient quantity of salt, is used for cooking. Liver is generally eaten raw and is considered a tidbit. I have seen the intestines eaten only when there was no meat.

FIG. 518. Ladle of musk ox horn. (National Museum, Washington. 10282.) ¼

Forks (Fig. 517)[1] are used to take the meat out of the kettle and the soup is generally poured out into a large cup. Before the introduction of European manufactures these vessels and dishes generally consisted of whalebone. One of these has been described by Parry (I, p. 286). It was circular in form, one piece of whalebone being bent into the proper shape for the sides and another flat piece of the same material sewed to it for a bottom, so closely as to make it perfectly watertight. A ladle or spoon (Fig. 518) is sometimes used in drinking it, but usually the cup is passed around, each taking a sip in turn. In the same way large pieces of meat are passed round, each taking as large a mouthful as possible and then cutting

[1] The fork first represented in this figure is evidently broken, a series of knobs having originally formed the handle.

off the bit close to the lips. They all smack their lips in eating. The Eskimo drink a great deal of water, which is generally kept in vessels standing near the lamps. When the men have finished their meal the women take their share, and then all attack the frozen meat which is kept in the storerooms. The women are allowed to participate in this part of the meal. An enormous quantity of meat is devoured every night, and sometimes they only suspend eating when they go to bed, keeping a piece of meat within reach in case they awake.

After dinner the seals, which have been placed behind the lamps to thaw, are thrown upon the floor, cut up, and the spare meat and skins are taken into the storerooms. If a scarcity of food prevails in the village and a hunter has caught a few seals, every inhabitant of the settlement receives a piece of meat and blubber, which he takes to his hut, and the successful hunter invites all hands to a feast.

The dogs are fed every second day after dinner. For this purpose two men go to a place at a short distance from the hut, taking the frozen food with them, which they split with a hatchet or the point of the spear. While one is breaking the solid mass the other keeps the dogs off by means of the whip, but as soon as the food is ready they make a rush at it, and in less than half a minute have swallowed their meal. No dog of a strange team is allowed to steal anything, but is kept at a distance by the dogs themselves and by the whip. If the dogs are very hungry they are harnessed to the sledge in order to prevent an attack before the men are ready. They are unharnessed after the food is prepared, the weakest first, in order to give him the best chance of picking out some good pieces. Sometimes they are fed in the house; in such a case, the food being first prepared, they are led into the hut singly; thus each receives his share.

All the work being finished, boots and stockings are changed, as they must be dried and mended. The men visit one another and spend the night in talking, singing, gambling, and telling stories. The events of the day are talked over, success in hunting is compared, the hunting tools requiring mending are set in order, and the lines are dried and softened. Some busy themselves in cutting new ivory implements and seal lines or in carving. They never spend the nights quite alone, but meet for social entertainment. During these visits the host places a large lump of frozen meat and a knife on the side bench behind the lamp and every one is welcome to help himself to as much as he likes.

The first comers sit down on the ledge, while those entering later stand or squat in the passage. When any one addresses the whole assembly he always turns his face to the wall and avoids facing the listeners. Most of the men take off their outer jacket in the house and they sit chatting until very late. Even the young children do not go to bed early.

The women sit on the bed in front of their lamps, with their legs under them, working continually on their own clothing or on that of the men, drying the wet footgear and mittens, and softening the leather by chewing and rubbing. If a bitch has a litter of pups it is their business to look after them, to keep them warm, and to feed

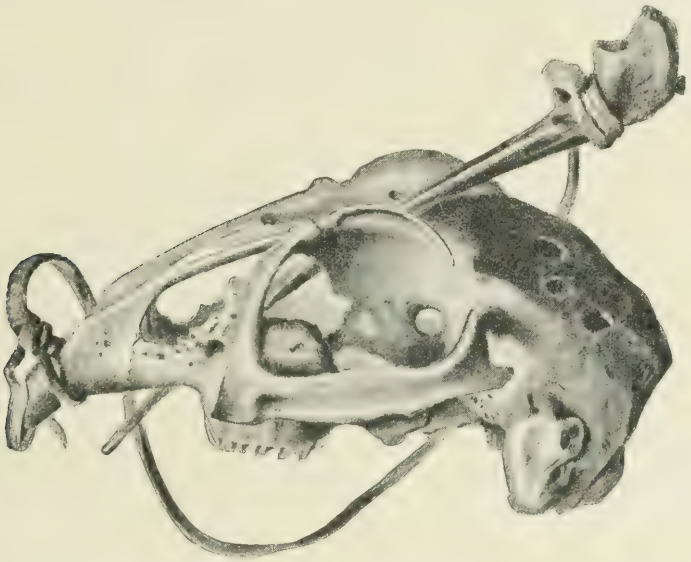


FIG. 519. Skull used in the game ajegaung, from Ungava Bay. (From L. M. Turner's collection.) (National Museum, Washington. 90227.) ⅛

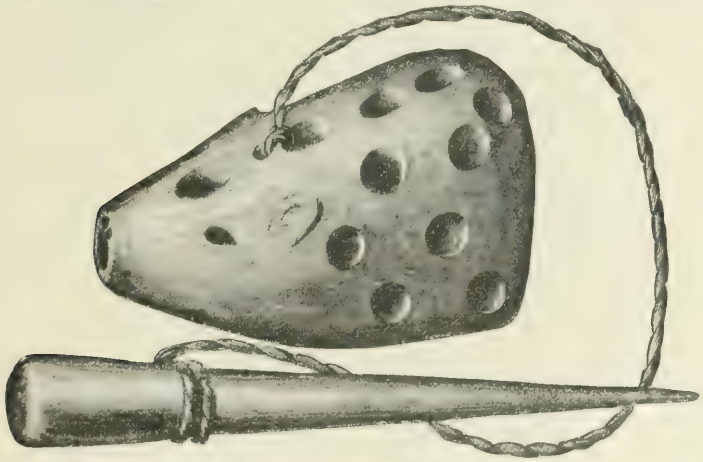
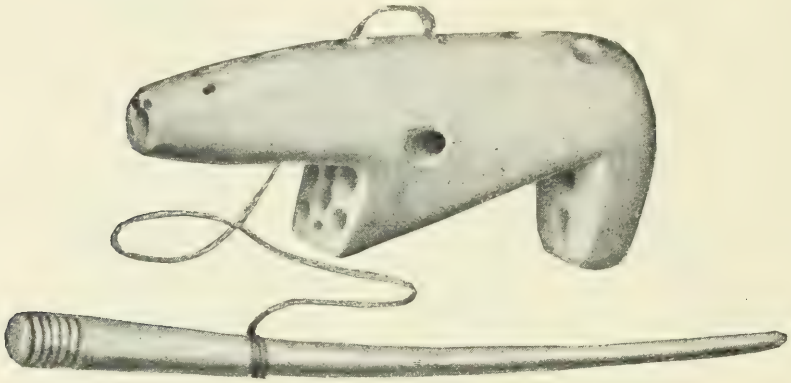


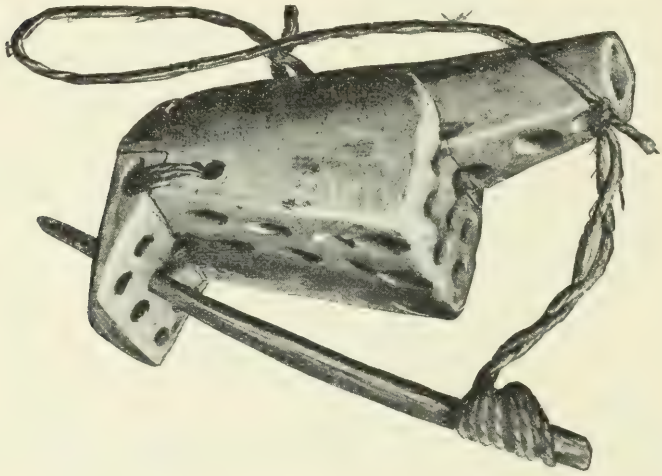
FIG. 520. Ivory carving representing head of fox, used in the game ajegaung. (Museum für Völkerkunde, Berlin. IV A 6820.) ⅛

them regularly. Generally the pups are put into a small harness and are allowed to crawl about the side of the bed, where they are tied to the wall by a trace. Young children are always carried in their mothers' hoods, but when about a year and a half old they are

allowed to play on the bed, and are only carried by their mothers when they get too mischievous. When the mother is engaged in any hard work they are carried by the young girls. They are weaned when about two years old, but women suckle them occasionally until they are three or four years of age. During this time they are frequently fed from their mothers' mouths. When about twelve years old they begin to help their parents, the girls sewing and preparing skins, the boys accompanying their fathers in hunting expeditions.



a



b

FIG. 521. Ivory carvings representing polar bear, used in the game ajegaung. *a* (Museum für Völkerkunde, Berlin. IV A 6819.) *b* (National Museum Washington. 34078.) ⅞

The parents are very fond of their children and treat them kindly. They are never beaten and rarely scolded, and in turn they are very dutiful, obeying the wishes of their parents and taking care of them in their old age.

In winter gambling is one of the favorite amusements of the Eskimo. Figs. 519–521 represent the ajegaung, used in a game somewhat similar to our cup and ball. The most primitive device is Fig. 519, a hare's skull with a number of holes drilled through it. A specimen was kindly lent to me by Lucien M. Turner, who brought it from Ungava Bay; but in Baffin Land exactly the same device is in use. Fig. 520 represents the head of a fox, in ivory; Fig. 521, a polar bear. The specimen shown in Fig. 521 *b* was brought from Cumberland Sound by Kumlien. The neck of the bear is more elaborate than the one shown in *a*. The attachment of the part representing the hind legs is of some interest. The game is played as follows: First, the skull or the piece of ivory must be thrown up and caught ten times upon the stick in any one of the holes. Then, beginning with the hole in front (the mouth), those of the middle line must be caught. The three holes on the neck of the bear are double, one crossing vertically, the other slanting backward, but both ending in one hole on the neck. After the mouth has been caught upon the stick the vertical hole in the neck is the next, then the oblique one, and so on down the middle line of the animal's body. If, in the first part of the game, the player misses twice he must give up the pieces to his neighbor, who then takes his turn. In the second part he is allowed to play on as long as he catches in any hole, even if it be not the right one, but as soon as he misses he must give it up. After having caught one hole he proceeds to the next, and the player who first finishes all the holes has won the game.

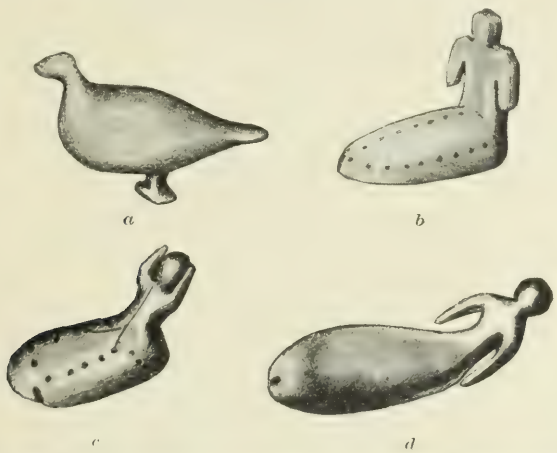


FIG. 522. Figures used in playing tingmiujang, a game similar to dice. (Museum für Völkerkunde, Berlin. IV A 6823.)

A game similar to dice, called tingmiujang, i. e., images of birds, is frequently played. A set of about fifteen figures like those represented in Fig. 522 belong to this game, some representing birds,

others men or women. The players sit around a board or a piece of leather and the figures are shaken in the hand and thrown upward. On falling, some stand upright, others lie flat on the back or on the side. Those standing upright belong to that player whom they face; sometimes they are so thrown that they all belong to the one who tossed them up. The players throw by turns until the last figure is taken up, the one getting the greatest number of the figures being the winner.

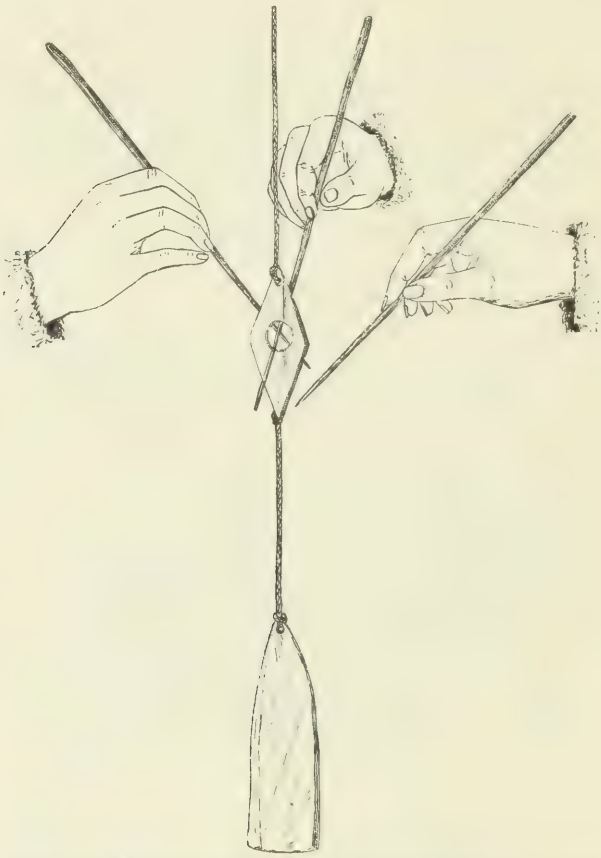


FIG. 523. Game of nuglutang. (Museum für Völkerkunde, Berlin. IV A 6821.)

A favorite game is the nuglutang (Fig. 523). A small, rhomboidal plate of ivory with a hole in the center is hung from the roof and steadied by a heavy stone or a piece of ivory hanging from its lower end. The Eskimo stand around it and when the winner of the last game gives a signal every one tries to hit the hole with a stick. The one who succeeds has won. This game is always played amid great excitement.

The sāketān resembles a roulette. A leather cup with a rounded

bottom and a nozzle is placed on a board and turned round. When it stops the nozzle points to the winner. At present a tin cup fastened with a nail to a board is used for the same purpose (Fig. 524).

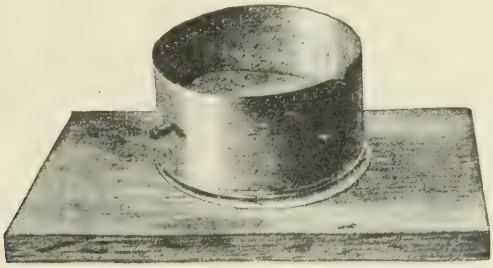


FIG. 524. The sāketān or roulette. (Museum für Völkerkunde, Berlin. IV A 6854.)

Their way of managing the gain and loss is very curious. The first winner in the game must go to his hut and fetch anything he likes as a stake for the next winner, who in turn receives it, but has to bring a new stake, in place of this, from his hut. Thus the only one who loses anything is the first winner of the game, while the only one who wins anything is the last winner.

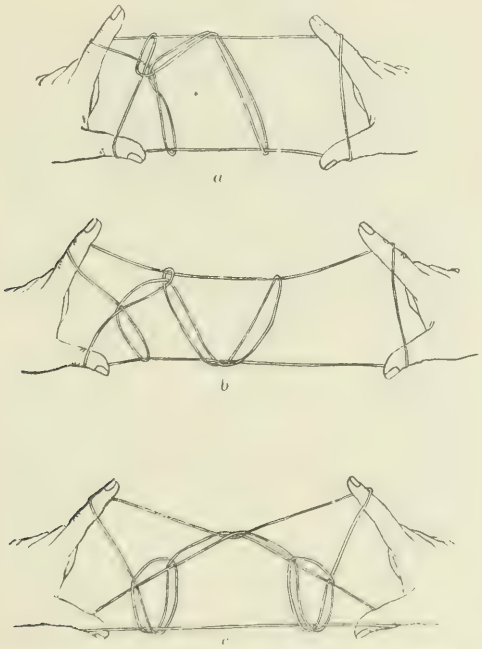


FIG. 525. The ajarorpoq or cat's cradle. *a* representing deer; *b*, hare; *c*, hill and ponds.

The women are particularly fond of making figures out of a loop, a game similar to our cat's cradle (ajarorpoq). They are, however,

much more clever than we in handling the thong and have a great variety of forms, some of which are represented in Fig. 525.

As an example I shall describe the method of making the device representing a deer (Fig. 525*a*): Wind the loop over both hands, passing it over the back of the thumbs inside the palms and outside the fourth fingers. Take the string from the palm of the right hand with the first finger of the left and vice versa. The first finger of the right hand moves over all the parts of the thong lying on the first and fourth fingers of the right hand and passes through the loop formed by the thongs on the thumb of the right hand; then it moves back over the foremost thong and takes it up, while the thumb lets go the loop. The first finger moves downward before the thongs lying on the fourth finger and comes up in front of all the thongs. The thumb is placed into the loops hanging on the first finger and the loop hanging on the first finger of the left hand is drawn through both and hung again over the same finger. The thumb and first finger of the right and the thumb of the left hand let go their loops. The whole is then drawn tight. A few other devices from Hudson Bay are represented by Klutschak (p. 139).

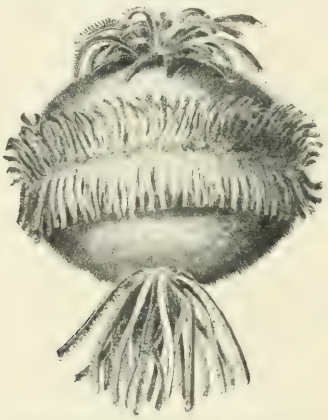


Fig. 526. Ball. (Museum für Völkerkunde, Berlin. IV A 6822.)

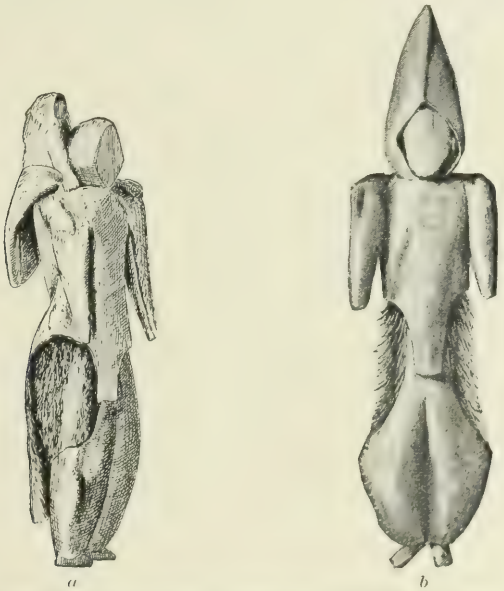
The ball (Fig. 526) is most frequently used in summer. It is made of sealskin stuffed with moss and neatly trimmed with skin straps. One man throws the ball among the players, whose object it is to keep it always in motion without allowing it to touch the ground. Another game of ball I have seen played by men only. A leather ball filled with hard clay is propelled with a whip, the lash of which is tied up in a coil. Every man has his whip and is to hit the ball and so prevent his fellow players from getting at it.

A third game at ball called igdlukitaqtung is played with small balls tossed up alternately from the right to the left, one always being in the air. Songs used in the game will be found in the last pages of this paper.

An amusement of women and children is to point successively on the forehead, the cheek, and the chin and to pronounce as rapidly as possible sulubautiχu'tika, tudliχu'tika, tadliχu'tika, tudliχú'tika, i. e., the forehead, the cheek, the chin, the cheek.

a *b*

FIG. 527. Dolls in dress of the Oqomiut. (Museum für Völkerkunde, Berlin. IV A 6702.) ⅓



a *b*

FIG. 528. Dolls in dress of the Akudnirmiut. (Museum für Völkerkunde, Berlin. IV A 6702.) ⅓

Young children play with toy sledges, kayaks, boats, bows and arrows, and dolls. The last are made in the same way by all the tribes, a wooden body being clothed with scraps of deerskin cut in the same way as the clothing of men. Fig. 527 shows dolls in the dress of the Oqomiut; Fig. 528, in that of the Akudnirmiut.

In summer children and grown up people exercise by sitting down on their knees in a large circle and simultaneously jumping up and down, by kneeling and holding their toes in their hands and trying to outdo one another in running in this position, &c.

A favorite amusement during the long winter nights is telling tales and composing songs. Old traditions are always related in a highly ceremonious manner. The narrator takes off his outer jacket, pulls the hood over his head, and sits down in the rear part of the hut, turning his face toward the wall, and then tells the story slowly and solemnly. All the stories are related in a very abridged form, the substance being supposed to be known. The form is always the same, and should the narrator happen to say one word otherwise than is customary he will be corrected by the listeners.

Children tell one another fables and sing short songs. Comic songs making fun of any person are great favorites. Details on the poetry and music of the Eskimo will be found further on.

Parry's description of the games and sports practiced by the Iglulirmiut is so interesting that I insert it here (II, p. 538):

On an occasion when most of the men were absent from the huts on a sealing excursion, the women joined in playing, one of them being the chief performer. Being requested to amuse the rest, she suddenly unbound her hair, platted it, tied both ends together to keep it out of her way, and then stepping out into the middle of the hut, began to make the most hideous faces that can be conceived, by drawing both lips into her mouth, poking forward her chin, squinting frightfully, occasionally shutting one eye, and moving her head from side to side as if her neck had been dislocated. This exhibition, which they call ajokitarpoq, and which is evidently considered an accomplishment that few of them possess in perfection, distorts every feature in the most horrible manner imaginable, and would, I think, put our most skillful horse-collar grinners quite out of countenance.

This performance is identical with one described later (p. 578) as practiced during the meals in summer.

The next performance consists in looking steadfastly and gravely forward and repeating the words tăbā'-tăbā'; kjaibo, kjaibo; kebang inutovik, kebang inutovik; amatama, amatama, in the order in which they are here placed, but each at least four times, and always by a peculiar modulation of the voice speaking them in pairs as they are coupled above. The sound is made to proceed from the throat in a way much resembling ventriloquism, to which art it is indeed an approach. After the last amatama she always point d with her finger toward her body, and pronounced the word angakoq, steadily retaining her gravity for five or six seconds, and then bursting into a loud laugh, in which she was joined by all the rest. The women sometimes produce a much more guttural and unnatural sound, repeating principally the word ikeri-ikeri, coupling them as before, and staring in such a manner as to make their eyes appear ready to burst out of their sockets with the exertion. Two or more of them will sometimes stand up face to face, and with great quickness and regularity respond to each other, keeping such exact time that the sound appears to come from one throat instead of several. Very few of the females are possessed of this accomplishment, which is called pitkusiraqpoq, and it is not uncommon to see several of the younger females practising it. A third part of the game, distinguished by the word kaitikpoq, consists only in falling on each knee alternately, a

piece of agility which they perform with tolerable quickness, considering the bulky and awkward nature of their dress. * * * Then the same woman came forward, and letting her arms hang down loosely and bending her body very much forward, shook herself with extreme violence, as if her whole frame had been strongly convulsed, uttering at the same time, in a wild tone of voice, some of the unnatural sounds before mentioned.

This being at an end, a new exhibition was commenced in which ten or twelve women took a part, and which our gentlemen compared to blind man's buff. A circle being formed, and a boy dispatched to look out at the door of the hut, a woman placed herself in the center, and, after making a variety of guttural noises for about half a minute, shut her eyes, and ran about till she had taken hold of one of the others, whose business it then became to take her station in the center, so that almost every woman in her turn occupied this post, and in her own peculiar way, either by distortion of countenance or other gestures, performed her part in the game. This continued three-quarters of an hour, and, from the precaution of placing a lookout who was withdrawn when it was over, as well as from some very expressive signs which need not here be mentioned, there is reason to believe that it is usually followed by certain indecencies, with which their husbands are not to be acquainted. * * *

The most common amusement however, and to which their husbands made no objection, they performed at Winter Island expressly for our gratification. The females, being collected to the number of ten or twelve, stood in as large a circle as the hut would admit, with a man in the center. He began by a sort of half howling, half singing noise, which appeared as if designed to call the attention of the women, the latter soon commencing the Amna Aya song. This they continued without variety, remaining quite still while the man walked round within the circle; his body was rather bent forward, his eyes sometimes closed, his arms constantly moving up and down, and now and then hoarsely vociferating a word or two as if to increase the animation of the singers, who, whenever he did this, quitted the chorus and rose into the words of the song. At the end of ten minutes they all left off at once, and after one minute's interval commenced a second act precisely similar and of equal duration, the man continuing to invoke their muse as before. A third act which followed this, varied frequently towards the close only in his throwing his feet up before and clapping his hands together, by which exertion he was thrown into a violent perspiration. He then retired, desiring a young man (who as we were informed was the only individual of several then present thus qualified) to take his place in the center as master of the ceremonies, when the same antics as before were again gone through. After this description it will scarcely be necessary to remark that nothing can be poorer in its way than this tedious singing recreation, which, as well as in everything in which dancing is concerned, they express by the word mumipoq. They seem, however, to take great delight in it; and even a number of the men as well as all the children crept into the hut by degrees to peep at the performance.

The Eskimo women and children often amuse themselves with a game not unlike our "skip-rope." This is performed by two women holding the ends of a line and whirling it regularly round and round, while a third jumps over it in the middle according to the following order. She commences by jumping twice on both feet, then alternately with the right and left, and next four times with the feet slipped one behind the other, the rope passing once round at each jump. After this she performs a circle on the ground, jumping about half a dozen times in the course of it, which bringing her to her original position, the same thing is repeated as often as it can be done without entangling the line. One or two of the women performed this with considerable agility and adroitness, considering the clumsiness of their boots and jackets, and seemed to pride themselves in some degree on the qualification. A

second kind of this game consists in two women holding a long rope by its ends and whirling it round in such a manner over the heads of two others standing close together near the middle of the bight, that each of these shall jump over it alternately. The art therefore, which is indeed considerable, depends more on those whirling the rope than on the jumpers, who are, however, obliged to keep exact time in order to be ready for the rope passing under their feet.

Of all these games I observed only the one called pitkusiraqpoq by Parry, which I saw played several times at Cumberland Sound. (See Appendix, Note 3.)

While in times of plenty the home life is quite cheerful, the house presents a sad and gloomy appearance if stormy weather prevents the men from hunting. The stores are quickly consumed, one lamp after another is extinguished, and everybody sits motionless in the dark hut. Nevertheless the women and men do not stop humming their monotonous amna aya and their stoicism in enduring the pangs of hunger is really wonderful. At last, when starvation is menacing the sufferers, the most daring of the men resolves to try his luck. Though the storm may rage over the icy plain he sets out to go sealing. For hours he braves the cold and stands waiting and watching at the breathing hole until he hears the blowing of the seal and succeeds in killing it.

When those who have remained at home hear the sound of the returning sledge, they rush out of the houses to meet it. Quickly they help the bold hunter to get on shore. The sledge is unloaded, the seal dragged into the house, and every one joyfully awaits his share. The animal is cut up, every household receiving a piece of meat and blubber. The gloomy huts are again lighted up and the pots, which had been out of use for some days, are again hung up over the lamps.

If the hunter, however, has tried in vain to procure food, if the storm does not subside, the terrors of famine visit the settlement. The dogs are the first to fall victims to the pressing hunger, and if the worst comes cannibalism is resorted to. But all these occurrences are spoken of with the utmost horror. In such cases children particularly are killed and eaten. Fortunately, however, such occurrences are very rare.

VISITING.

As soon as the ice has consolidated in winter a lively intercourse springs up between the settlements. Friends visit one another, trading excursions are undertaken, and almost every few days visitors arrive at the village. They are welcomed with great hospitality. The sledge is unloaded and the dogs are fed by the host. The visitor is led into the hut, served with the choicest pieces of meat, and the hostess puts his clothing in order. In the winter these visits are generally short, rarely lasting more than a few days.

Longer journeys are postponed until spring, when food can be procured more easily. These journeys are planned a long time before they are made. While the families generally leave what they can spare of their household goods in winter at their summer settlement, they bring away everything they possess to the winter village if they intend to visit a neighboring tribe in the spring. In April or May they leave their snow houses; the tent poles and the whole of their goods are loaded upon the sledge, only the boats being left behind in charge of some friend, and then they start upon their long, lonely journey. On the first day they do not travel far, but make the first halt after about a twelve-mile journey. As the load is heavy the men and women sit on the top of the sledges only to rest. The driver walks alongside and the women lead the way, the dogs pulling more willingly if they see somebody ahead of the sledge. At night it is not unloaded, only those things being taken out which are necessary for building a small tent and for cooking. In order to protect the sledge from the attacks of the dogs, the pitu (see p. 530) is taken out and fastened to an eye cut into the ice with the end of the spear. After having traveled about three days a longer halt is made ; the sledge is unloaded, the dogs are unharnessed, and the men go out hunting in order to procure food for the dogs and for themselves. Thus they slowly proceed until they at last reach the end of their journey. Here they settle down with the friends whom they have come to visit, establish a hut of their own, and spend a whole year with them. In the following spring they retrace their journey to their own homes. Journeys of four to five hundred miles in one spring are not of rare occurrence; longer journeys, however, frequently last for years.

A journey of two hundred miles, going and coming, is sometimes accomplished in one season. For such a journey they would set out in March or April, leaving all their goods behind, and live with the friends whom they visit for a month or two, returning about June. While on the visit the visitors help their friends to provide for their families.

In traveling in the spring the Eskimo always use snow goggles to protect themselves from snow blindness. The modern ones (Fig. 529), which are made of wood and have a shade and a narrow slit for each eye, are very effective. The old design is represented in Fig. 530, the specimen being made of ivory.

Long journeys are sometimes made in summer, several families traveling together in their boats. As, however, the open season is very short in many parts of Northeastern America, spring journeys are more frequently made.

When traveling by boat the tent poles, skin covers, and all the household goods are stowed away in the bottom. The women do the pulling, three or four working at each oar, while a man sits on the stern board steering with a paddle. They move on at their leisure,

stopping whenever they are tired or when a seal is seen blowing near the boat. The kayaks are tied to the stern and towed along. Children and dogs lie about in the bottom of the boat. In the center there is a tub containing all kinds of provisions, and every now and then they take some refreshment from it. During the nights the

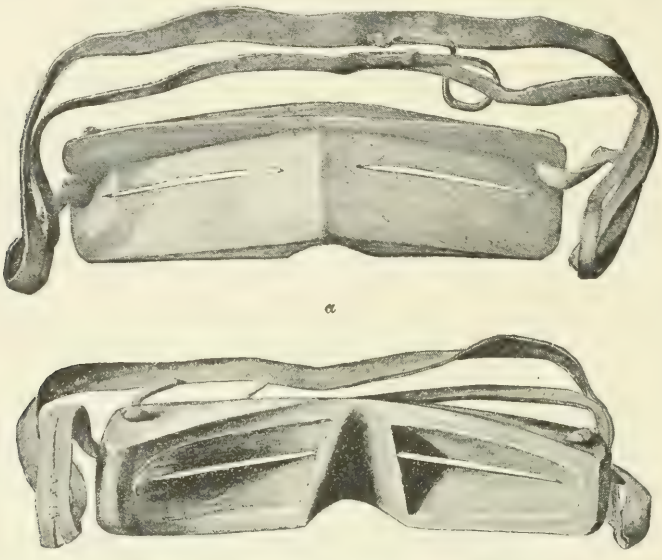


FIG. 529. Modern snow goggles, of wood. (National Museum, Washington, 29078.) ½

tents are erected at suitable points. The natives are well acquainted with these, and, if they are not compelled by severe weather to seek shelter at the nearest point, always visit the same places. These have a smooth, sloping beach, fresh water, and dry, gravelly places in which the tents are built.

FIG. 530. Old form of snow goggles, of ivory, found in Idjorituaqtuin, Cumberland Sound. (Museum für Völkerkunde, Berlin. IV A 6833.)

SOCIAL CUSTOMS IN SUMMER.

When the rays of the sun begin to be warmer and the roofs of the snow houses tumble down the natives live in a very uncomfortable way until a sufficient number of sealskins are procured to build a tent. Sometimes a family live under a roof too small to cover them

all, though they sit as close as possible, and too low to permit them to sit upright; but, as seals are basking everywhere on the ice, this state of affairs does not last long. The women split a number of large skins and dry them on the snow, and by the middle of May they can build a pretty large tent; but it is not until they settle permanently at the place of the summer village that the large tent is sewed and put up.

At this season salmon and venison form the staple food of the Eskimo. The old men, women, and children, who stay at the lakes or at the salmon rivers, depend almost entirely upon this food. They fish and eat the salmon in a raw as well as in a cooked state. Birds are caught and eaten raw. The surplus salmon are split and dried on poles erected for the purpose. Deer shoulders, legs, and backs are also cut into thin pieces and dried. Sometimes the dried fish and venison are deposited in stone caches for later use, but most of it is eaten in summer, especially when the Eskimo go traveling. When the men go deer hunting they take a supply of dried salmon with them, and thus can stay out for a week or even longer. When a deer is killed it is skinned at once, the legs being slit and the belly opened. The paunch is carefully tied up, as the contents are a favorite dish of the Eskimo. The head, the legs, and the ribs are cut off and after being piled up the whole is covered with heavy stones, only the horns protruding from the top of the depot. The hams and the skin are generally carried to the hut at once, and, if the distance is not too great or the carcass can be reached with sledges or boats, the whole animal is brought home. Large depots are only made in the fall, when there is no danger of the meat spoiling.

At this season the natives visit deer passes and lakes, near which they establish their huts. The tents and all the household goods are packed up in heavy bundles, some of which are carried by the dogs, the load hanging on both sides of the back; others, by men and women, being secured by one strap which passes over the forehead and by another which passes over the breast. Their strength and their perseverance in carrying heavy loads over long distances are remarkable.

The social life in the summer settlements is rather different from that in winter. At this season the families do not cook their own meals, but a single one provides for the whole settlement. The day before it is her turn to cook, the woman goes to the hills to fetch shrubs for the fire. Three stones are put up near the hut as a fireplace, the opening facing the wind. The kettle is placed on the top of it and the fire is fed with shrubs and blubber. When the meal is ready the master of the house stands beside it, crying Ujo! Ujo! (boiled meat) and everybody comes out of the hut provided with a knife. The dish is carried to a level place and the men sit down around it in one circle, while the women form another. Then large

lumps of meat are passed around, everybody cutting off a piece and taking a swallow of the soup, which is passed around in a large leather cup. These dinners, which are held in the evening after the return from the hunt, are almost always enlivened by a mimic performance. A man or an old woman sits down in the center of the circle and amuses the assembly by singing and dancing or by making faces. A favorite performance is one in which a man, with blackened face and with a thong tied around his head, writhes and makes odd grimaces.

After dinner the men sit chatting or gambling before the huts, while the women and children amuse themselves by running about, playing at ball, or dancing.

A strict religious custom forbids the Eskimo to work on the deer-skins which are obtained in summer before the ice has formed; they are only dried and tied up in large bundles. In the fall, when on their way to the winter settlements, the Eskimo travel rather quickly. The boats are piled up with the spoils of the summer hunt and the place of destination is generally reached before the stormy weather sets in.

When it gets colder short excursions are made by boat in order to collect shrubs for covering the tents. Several families join in building a common hut, and on a fine day the old tents are torn down and the tent poles are converted into a strong frame, which is covered with a double roof. The bed and the platforms for the lamps are raised and henceforth all the cooking is done inside.

As soon as the first seals are caught with the harpoon the deer skins are prepared. If they were deposited under stones in summer, sledges set out to bring them to the settlements, and then they are distributed for winter clothing. According to Hall the western tribes are in the habit of spreading all the skins on one place and distributing them among the inhabitants of the settlement. I did not observe the same custom among the eastern tribes. Then they devote themselves to dressing the skins. On Davis Strait this work falls to the share of the women, while among the Hudson Bay tribes it is done by the men. At this season the great religious feasts of the natives are celebrated, which announce, as it were, the commencement of winter.

SOCIAL ORDER AND LAWS.

The social order of the Eskimo is entirely founded on the family and on the ties of consanguinity and affinity between the individual families. Generally children are betrothed when very young, but these engagements, not being strictly binding, may be broken off at any time. When the children reach maturity the girl learns the duties of a woman and the boy those of a man. As soon as he is

able to provide for a family and she can do the work falling to her share, they are allowed to marry. It happens frequently that the young man's parents are unwilling to allow him to provide for his parents-in-law, and then *he* may be rejected at any moment. Usually the young couple must begin housekeeping with the young wife's family and the young man, if belonging to a strange tribe, must join that of his wife. It is not until after his parents-in-law are dead that he is entirely master of his own actions. Though the betrothal be entered into in the days of childhood the bride must be bought from the parents by some present. In other instances the men choose their wives when grown up and sometimes a long wooing precedes the marriage. The consent of the bride's parents, or, if they are dead, that of her brothers, is always necessary. Marriages between relatives are forbidden: cousins, nephew and niece, aunt and uncle, are not allowed to intermarry. There is, however, no law to prevent a man from marrying two sisters. It is remarkable that Lyon states just the reverse (p. 353). I am sure, however, that my statements are correct in reference to the Davis Strait tribes.

Should the newly married couple join the wife's family this would serve as a check to polygamy, which, however, is quite allowable. It is only when the new family settles on its own account that a man is at full liberty to take additional wives, among whom one is always considered the chief wife. Monogamy is everywhere more frequent than polygamy, only a very few men having two or more wives. According to Ross polyandry occurs with the Netchillirmiut (II, pp. 356, 373). As long as the mother-in-law lives with the young family the wives are subordinate to her, while the mothers of both parties are independent of each other. No example came to my notice of both parents living with the newly married couple. Sometimes the man and wife do not set up a new household at once, but each remains at home. The property necessary for establishing a new family is the hunting gear of the man and the knife, scraper, lamp, and cooking pot of the women.

A strange custom permits a man to lend his wife to a friend for a whole season or even longer and to exchange wives as a sign of friendship. On certain occasions it is even commanded by a religious law (see p. 605). Nevertheless I know of some instances of quarrels arising from jealousy. Lyon states, however, that this passion is unknown among the Iglulirmiut (p. 355). The husband is not allowed to maltreat or punish his wife; if he does she may leave him at any time, and the wife's mother can always command a divorce. Both are allowed to remarry as soon as they like, even the slightest pretext being sufficient for a separation.

I may be allowed to refer once more to the division of labor between the man and woman. The principal part of the man's work is to provide for his family by hunting, i. e., for his wife and children and

for his relatives who have no provider. He must drive the sledge in traveling, feed the dogs, build the house, and make and keep in order his hunting implements, the boat cover and seal floats excepted. The woman has to do the household work, the sewing, and the cooking. She must look after the lamps, make and mend the tent and boat covers, prepare the skins, and bring up young dogs. It falls to her share to make the inner outfit of the hut, to smooth the platforms, line the snow house, &c. On Davis Strait the men cut up all kinds of animals which they have caught; on Hudson Bay, however, the women cut up the seals. There the men prepare the deerskins, which is done by the women among the eastern tribes. Everywhere the women have to do the rowing in the large boats while the man steers. Cripples who are unable to hunt do the same kind of work as women.

Children are treated very kindly and are not scolded, whipped, or subjected to any corporal punishment. Among all the tribes infanticide has been practiced to some extent, but probably only females or children of widows or widowers have been murdered in this way, the latter on account of the difficulty of providing for them. It is very remarkable that this practice seems to be quite allowable among them, while in Greenland it is believed that the spirit of the murdered child is turned into an evil spirit, called angiaq, and revenges the crime (Rink, p. 45).

Besides the children properly belonging to the family, adopted children, widows, and old people are considered part of it. Adoption is carried on among this people to a great extent.

If for any reason a man is unable to provide for his family or if a woman cannot do her household work, the children are adopted by a relative or a friend, who considers them as his own children. In the same way widows with their children are adopted by their nearest relative or by a friend and belong to the family, though the woman retains her own fireplace.

It is difficult to decide which relative is considered the nearest, but the ties of consanguinity appear to be much closer than those of affinity. If a woman dies the husband leaves his children with his parents-in-law and returns to his own family, and if a man dies his wife returns to her parents or her brothers, who are the nearest relatives next to parents or children. When a woman dies, however, after the children are grown up the widower will stay with them. In case of a divorce the children generally remain with the mother.

As a great part of the personal property of a man is destroyed at his death or placed by his grave, the objects which may be acquired by inheritance are few. These are the gun, harpoon, sledge, dogs, kayak, boat, and tent poles of the man and the lamp and pots of the woman. The first inheritor of these articles is the eldest son living

with the parents. Sons and daughters having households of their own do not participate in the inheritance. An elder adopted son has a preference over a younger son born of the marriage. Details of the laws which relate to inheritance are unknown to me.

Sometimes men are adopted who may almost be considered servants. Particularly bachelors without any relations, cripples who are not able to provide for themselves, or men who have lost their sledges and dogs are found in this position. They fulfill minor occupations, mend the hunting implements, fit out the sledges, feed the dogs, &c.; sometimes, however, they join the hunters. They follow the master of the house when he removes from one place to another, make journeys in order to do his commissions, and so on. The position, however, is a voluntary one, and therefore these men are not less esteemed than the self dependent providers.

Strangers visiting their friends for a season are generally in a similar position, though they receive a wife if the host happens to have more than one; if the friend has hunting gear, a sledge, and dogs of his own, he can arrange a separate fireplace in the hut.

In summer most families have each their own tent, but in the fall from two to four join in building a house. Frequently the parents live on one side, the family of the son-in-law on the other, and a friend or relative in a small recess. Sometimes two houses have a common entrance or the passages communicate with one another. The inhabitants of both parts usually live quite independently of one another, while the oldest man of every house has some influence over his housemates.

If the distance between the winter and the summer settlement is very great or when any particular knowledge is required to find out the haunts of game, there is a kind of chief in the settlement, whose acknowledged authority is, however, very limited. He is called the pimain (i. e., he who knows everything best) or the issumautang. His authority is virtually limited to the right of deciding on the proper time to shift the huts from one place to the other, but the families are not obliged to follow him. At some places it seems to be considered proper to ask the pimain before moving to another settlement and leaving the rest of the tribe. He may ask some men to go deer hunting, others to go sealing, but there is not the slightest obligation to obey his orders.

Every family is allowed to settle wherever it likes, visiting a strange tribe being the only exception. In such a case the newcomer has to undergo a ceremony which consists chiefly in a duel between a native of the place and himself. If he is defeated he runs the risk of being killed by those among whom he has come (see pp. 465, 609).

There are numerous regulations governing hunting, determining to whom the game belongs, the obligations of the successful hunter towards the inhabitants of the village, &c.

When a seal is brought to the huts everybody is entitled to a share of the meat and blubber, which is distributed by the hunter himself or carried to the individual huts by his wife. This custom is only practiced when food is scarce. In time of plenty only the housemates receive a share of the animal.

A ground seal belongs to all the men who take part in the hunt, the skin especially being divided among them. A walrus is cut up at once into as many parts as there are hunters, the one who first struck it having the choice of the parts and receiving the head. A whale belongs to the whole settlement and its capture is celebrated by a feast (p. 603).

A bear or a young seal belongs to the man who first saw it, no matter who kills it.

Lost objects must be restored to the owner if he is known, game, however, excepted; for example, if a harpoon line breaks and the animal escapes, but is found later by another man, the game belongs to the latter. In Hudson Bay he is also allowed to keep the harpoon and line.

There is no way of enforcing these unwritten laws and no punishment for transgressors except the blood vengeance. It is not a rare occurrence that a man who is offended by another man takes revenge by killing the offender. It is then the right and the duty of the nearest relative of the victim to kill the murderer. In certain quarrels between the Netchillirmiut and the Aivillirmiut, in which the murderer himself could not be apprehended, the family of the murdered man has killed one of the murderer's relations in his stead. Such a feud sometimes lasts for a long time and is even handed down to a succeeding generation. It is sometimes settled by mutual agreement. As a sign of reconciliation both parties touch each other's breasts, saying, Ilaga (my friend) (Klutschak, p. 70).

If a man has committed a murder or made himself odious by other outrages he may be killed by any one simply as a matter of justice. The man who intends to take revenge on him must ask his countrymen singly if each agrees in the opinion that the offender is a bad man deserving death. If all answer in the affirmative he may kill the man thus condemned and no one is allowed to revenge the murder. (See Appendix, Note 4.)

Their method of carrying on such a feud is quite foreign to our feelings. Strange as it may seem, a murderer will come to visit the relatives of his victim (though he knows that they are allowed to kill him in revenge) and will settle with them. He is kindly welcomed and sometimes lives quietly for weeks and months. Then he is suddenly challenged to a wrestling match (see p. 609), and if defeated is killed, or if victorious he may kill one of the opposite party, or when hunting he is suddenly attacked by his companions and slain.

RELIGIOUS IDEAS AND THE ANGAKUNIRN (PRIESTHOOD).

Although the principal religious ideas of the Central Eskimo and those of the Greenlanders are identical, their mythologies differ in many material points. I will only mention here that they believe in the Tornait of the old Greenlanders, while the Tornarsuk (i. e., the great Tornaq of the latter) is unknown to them. Their Supreme Being is a woman whose name is Sedna.

The first report on this tradition is found in Warmow's journal of his visit to Cumberland Sound (Missionsblatt aus der Brüdergemeinde, 1859, No. I, p. 19). The editor says:

> The name of the good spirit is Sanaq or Sana, and he seems to be worshiped as the unknown deity. Nobody could give a definite answer to Brother Warmow's frequent questions as to what they believed he was. They only said they invoked his help if they were in need. "Then we ask him," one of the men said, "and Takaq (the moon) gives us what we want, seals and deer." Another one said that Sanaq had lived on the earth and afterwards ascended to the moon.

In Hall's account of his explorations in Frobisher Bay it is mentioned that the tribes of that country, the Nugumiut, believe in a Supreme Being, and the following statement is given (Hall I, p. 524):

> There is one Supreme Being, called by them Anguta, who created the earth, sea, and heavenly bodies. There is also a secondary divinity, a woman, the daughter of Anguta, who is called Sidne. She is supposed to have created all things having life, animal and vegetable. She is regarded also as the protecting divinity of the Inuit people. To her their supplications are addressed; to her their offerings are made; while most of their religious rites and superstitious observances have reference to her.

It is of great importance that in the journals of Hall's second journey Sedna is mentioned a few times (spelled Sydney), this being the only proof that she is known among the tribes of Hudson Bay.

The statements of the whalers visiting the Sikosuilarmiut and the Akuliarmiut of Hudson Strait correspond with my own observations. Before entering into a comparison of this tradition with similar ones belonging to other tribes, I will give the particulars of the myth as I received it from the Oqomiut and the Akudnirmiut.

SEDNA AND THE FULMAR.

Once upon a time there lived on a solitary shore an Inung with his daughter Sedna. His wife had been dead for some time and the two led a quiet life. Sedna grew up to be a handsome girl and the youths came from all around to sue for her hand, but none of them could touch her proud heart. Finally, at the breaking up of the ice in the spring a fulmar flew from over the ice and wooed Sedna with enticing song. "Come to me," it said; "come into the land of the

birds, where there is never hunger, where my tent is made of the most beautiful skins. You shall rest on soft bearskins. My fellows, the fulmars, shall bring you all your heart may desire; their feathers shall clothe you; your lamp shall always be filled with oil, your pot with meat." Sedna could not long resist such wooing and they went together over the vast sea. When at last they reached the country of the fulmar, after a long and hard journey, Sedna discovered that her spouse had shamefully deceived her. Her new home was not built of beautiful pelts, but was covered with wretched fishskins, full of holes, that gave free entrance to wind and snow. Instead of soft reindeer skins her bed was made of hard walrus hides and she had to live on miserable fish, which the birds brought her. Too soon she discovered that she had thrown away her opportunities when in her foolish pride she had rejected the Inuit youth. In her woe she sang: "Aja. O father, if you knew how wretched I am you would come to me and we would hurry away in your boat over the waters. The birds look unkindly upon me the stranger; cold winds roar about my bed; they give me but miserable food. O come and take me back home. Aja."

When a year had passed and the sea was again stirred by warmer winds, the father left his country to visit Sedna. His daughter greeted him joyfully and besought him to take her back home. The father hearing of the outrages wrought upon his daughter determined upon revenge. He killed the fulmar, took Sedna into his boat, and they quickly left the country which had brought so much sorrow to Sedna. When the other fulmars came home and found their companion dead and his wife gone, they all flew away in search of the fugitives. They were very sad over the death of their poor murdered comrade and continue to mourn and cry until this day.

Having flown a short distance they discerned the boat and stirred up a heavy storm. The sea rose in immense waves that threatened the pair with destruction. In this mortal peril the father determined to offer Sedna to the birds and flung her overboard. She clung to the edge of the boat with a death grip. The cruel father then took a knife and cut off the first joints of her fingers. Falling into the sea they were transformed into whales, the nails turning into whalebone. Sedna holding on to the boat more tightly, the second finger joints fell under the sharp knife and swam away as seals (*Pagomys fœtidus*); when the father cut off the stumps of the fingers they became ground seals (*Phoca barbata*). Meantime the storm subsided, for the fulmars thought Sedna was drowned. The father then allowed her to come into the boat again. But from that time she cherished a deadly hatred against him and swore bitter revenge. After they got ashore, she called her dogs and let them gnaw off the feet and hands of her father while he was asleep. Upon this he cursed himself, his daughter, and the dogs which had maimed him;

whereupon the earth opened and swallowed the hut, the father, the daughter, and the dogs. They have since lived in the land of Adlivun, of which Sedna is the mistress.

This tradition is handed down in an old song. I shall give the substance of it here, as it differs in some points from the above myth.

The story begins when the fulmar carries Sedna to his home and she discovers that he has brought her to a very wretched tent. The next year the father and a brother, whom I find mentioned nowhere else, came to visit her and take her home. The fulmar follows their boat and causes a heavy gale to rise which almost upsets it. The father cuts off her fingers, which are transformed into whales, seals, and ground seals. Besides, he pierces her eye and thus kills her. Then he takes the body into the boat and carries it to the shore. There he lays it on the beach and covers it with a dogskin. When the flood comes in it covers Sedna.

Sedna and her father are described by the angakut (see p. 591), who sometimes visit her house or see them when both dwell among the natives, as follows: She is very large and much taller than the Inuit. In accordance with the second form of the tradition she has only one eye and is scarcely able to move. Her father is also a cripple and appears to the dying, whom he grasps with his right hand, which has only three fingers.

There is a remarkable resemblance between this tradition and one related by Lyon (p. 362), who describes the religious ideas of the Iglulirmiut, more particularly the genii of one of their angakut. He says that the principal spirits are Aiviliajoq (Ay-willi-ay-oo) or Nuliajoq (Noo-le-ay-oo), a female spirit, and her father, Napajoq (Nappayok) or Anautalik (An-now-ta-lig). Then he continues:

> The former is in the first place the mother, protectress, and not unfrequently the monopolist of sea animals, which she sometimes very wantonly confines below, and by that means causes a general scarcity in the upper world. When this is the case, the angakok is persuaded to pay her a visit, and attempt the release of the animals on which his tribe subsist. I know not what ceremonies he performs at the first part of the interview; but as the spell by which the animals are held lies in the hand of the enchantress, the conjuror makes some bold attempts to cut it off, and, according to his success, plenty, more or less, is obtained. If deprived of her nails, the bears obtain their freedom; amputation of the first joint liberates the netsiq (*Pagomys*); while that of the second loosens the ugjuq (*Phoca*). Should the knuckles be detached whole herds of walrus rise to the surface; and should the adventurous angakoq succeed in cutting through the lower part of the metacarpal bones, the monstrous whales are disenthralled and delightedly join the other creatures of the deep. * * * Her house is exceedingly fine, and very like a Kabluna (European) looking-glass (?); and, what is still more attractive to an Eskimo, it contains plenty of food. Immediately within the door of the dwelling, which has a long passage of entrance, is stationed a very large and fierce dog, which has no tail, and whose hinder quarters are black. * * * Aiviliajoq is described as being equally wonderful in her personal appearance as in her actions. She is very tall and has but one eye, which is the left, the place of the other being covered by a profusion of black

hair. She has one pigtail only, contrary to the established fashion in the upper Eskimo world, which is to wear one on each side of the face, and this is of such immense magnitude, that a man can scarcely grasp it with both hands. Its length is exactly twice that of her arm, and it descends to her knee. The hood of her jacket is always worn up. * * *

Her father has but one arm, the hand of which is covered by a very large mitten of bearskin. * * * He is not larger than a boy of ten years of age. He bears the character of a good, quiet sort of person and is master of a very nice house, which, however, is not approachable, on account of the vast herds of walrus lying round it, which, with numerous bears, make a terrific howling. * * * He has nothing to eat, and does not even require it; in which particular he differs widely from his daughter, who has a most voracious appetite. I know not if he is the father of all terrestrial animals, but he is certainly their patron, and withholds them at times from the Eskimo.

The name of the father, Anautalik (An-now-ta-lig), i. e., the man with something to cut (with a knife), is very remarkable. Besides, it is interesting that the angakoq who visits the dwelling of Nuliajoq has to cut off her hand in order to liberate the sea animals. In the tradition related in the foregoing, Sedna has another name, to wit, Uinigumisuitung, i. e., she who would not have a husband; her father, Savirqong, i. e., the man with the knife. Often he is only called Anguta, her father.

It is evident that Nuliajoq is identical with Sedna, though some peculiarities exist in the tradition as related by Lyon which it is rather difficult to reconcile with the myth as it is related among the Oqomiut. It seems to me that this difficulty arises from the mixing up of the angakoq's visit to Sedna with the tradition itself. Indeed Lyon only refers to the angakoq's visit to Nuliajoq, whom he considers a genius of a great angakoq, though he remarks in another place (p. 363) that she "has a boundless command over the lives and destinies of mankind."

The tale of the angakoq's visit makes the tradition very similar to the Greenland myth of Arnaquagsaq, i. e., the old woman. According to Cranz (p. 264) and to Rink (p. 40) this spirit has her abode in the depth of the ocean. She represents the source of nourishment, supplying the physical wants of mankind. She sits in her dwelling in front of a lamp, beneath which is placed a vessel which receives the oil that keeps flowing down from the lamp. From this vessel, as well as from the dark interior of her hut, she sends out all the animals which serve for food, but in certain cases withholds the supply, thus causing want and famine. The reason for thus withholding the supply was that certain filthy and noxious parasites fastened themselves upon her head, of which she could only be relieved by an angakoq. Then she could be induced again to send out the animals for the benefit of man. In going to her he (the angakoq) had first to pass the Arsissut and then to cross an abyss, in which, according to the earliest authors, a wheel as slippery as ice was constantly

turning around; then, having safely passed a boiling kettle with seals in it, he arrived at the house, in front of which watch was kept by terrible animals, sometimes described as seals, sometimes as dogs; and, lastly, within the house passage itself, he had to cross an abyss by means of a bridge as narrow as a knife edge.

About the same tale is found among the Baffin Land tribes; according to Captain Spicer, of Groton, Conn., she is called Nanoquagsaq by the Akuliarmiut. She is visited by the angakut, who liberate the sea animals by subduing her or rather by depriving her of a charm by which she restrains the animals.

I am inclined to think that the form in which Lyon gives this tradition is not quite correct, but is a mixture of the Sedna myth and that of the angakoq's visit to Arnaquagsaq. This seems the more probable from a Greenland tale which Dr. Rink kindly communicated to me, in which it is related that the grandfather of Arnaquagsaq cut off her fingers, which were changed into sea animals.

For this reason it is most probable that Arnaquagsaq, Sedna, and Nuliajoq proceed from the same myth, though the traditions differ from one another as they are related by the travelers. In the mythology of the central tribes this character has a much more decided influence upon their religious belief than the Arnaquagsaq of the Greenlanders seems to have had.

The myth of Sedna is confused with another which treats of the origin of the Europeans and of the Adlet (see p. 637). The legends are in part almost identical. Sedna orders her dog to gnaw off her father's feet; Uinigumisuitung's children maim their grandfather in the same way; and, besides, Sedna's second name is also Uinigumisuitung. In both tales the father is called Savirqong. In Lyon's Private Journal (p. 363) an important statement is found to the effect that the dog which protects Nuliajoq's dwelling is by some natives called her husband, by others merely her dog, but that he is generally considered the father of Erqigdlit (identical with Adlet, p. 637) and Qadlunait (Europeans).

Finally, I must record the legend of the origin of the walrus and the reindeer, which is closely related to the Sedna tradition. I could never learn any other reason why the use of sea animals and reindeer at the same period should be forbidden, except the fear of offending Sedna. She is represented as disliking the deer, which accordingly are not found in her house. Any reason for this dislike is not given. The Akuliarmiut, however, have a tradition that a woman, most probably Sedna herself, created the walrus and the reindeer during a famine. She opened her belly and took out a small piece of fat which she carried up the hills where it was transformed by a magic spell into a reindeer. As soon as she saw the animal she became frightened and ordered it to run away, but the deer turned upon her and would not go; then she became angry and knocked out its teeth.

It turned round at once, but before it could leave she gave it a kick which lopped off its tail. Thus it happened that the deer is deficient as to certain teeth and has scarcely any tail. The woman, however, continued to hate the deer. Afterward she descended to the beach and threw another piece of fat into the water. It was transformed into a walrus, which swam away at once. (According to a communication of Captain Spicer.)

The form of this tradition as related by the Akudnirmiut is somewhat different. During a famine a woman (I could not learn whether she was identical with Sedna or not) carried her boots to the hills and transformed them by magic into deer, which spread all over the country. Then she carried her breeches to the sea, where they were changed into walrus. The first deer, however, had large tusks and no horns, while the walrus had horns and no tusks. The Eskimo soon found that this was very dangerous for the hunter, as the deer killed pursuers with their tusks, while the walrus upset the boats. Therefore an old man transferred the horns to the deer and the tusks to the walrus.

It is very probable that this woman was Sedna, as the Eskimo affirm that the observances referring to walrus and deer are commanded by Sedna and as the first tradition accounts for her dislike of the deer.

I could not find any trace of the tradition reported by Lyon, that Anautalik, Nuliajoq's father, is the protector of land animals, nor of that of a being to whom he refers by the name of Pukimna (derived from pukiq, the white parts of a deerskin), who lives in a fine country far to the west and who is the immediate protectress of deer, which animals roam in immense herds around her dwelling.

Sedna is the mistress of one of the countries to which the souls go after death. It has been related in the foregoing tradition of Sedna and the fulmar that she descended to Adlivun; since that time she has been the mistress of the country, and when invoked as such has the name of Idliragijenget. She has a large house, in which no deerskins are found. There she lives with her father, each occupying one side of it. The father, who is unable to move, lies on the ledge and is covered with old skins. In the entrance across the threshold lies Sedna's dog watching her house. Like her, the father has only one eye, and he never moves from his place while in the house.

The dead, who are seized by Sedna's father, Anguta, are carried to this dwelling. The dog moves aside only a little, just enough to allow the souls to pass. They have to stay in this dismal abode during a whole year, lying by the side of Anguta, who pinches them.

The happy land is heaven and is called Qudlivun (the uppermost ones). It abounds with deer, which are easily caught, and no ice or snow ever visits it.

The Oqomiut and the Akudnirmiut make a distinction between Adlivun and Adliparmiut. Adlivun means "those who live beneath us;" Adliparmiut, "the inhabitants of the country farthest below us;" and the same difference exists between Qudlivun and Qudliparmiut. Though these names intimate the probability that the Eskimo believe in a series of places, located in a descending scale, each below the other, I could not find any more detailed description of the conception.

Hall's observations agree fairly with my own. He says (I, p. 524):

Qudliparmiut (heaven) is upward. Everybody happy there. All the time light: no snow, no ice, no storms; always pleasant; no trouble; never tired; sing and play all the time—all this to continue without end.

Adliparmiut (hell) is downward. Always dark there. No sun; trouble there continually; snow flying all the time, terrible storms; cold, very cold; and a great deal of ice there. All who go there must always remain.

All Inuit who have been good go to Qudliparmiut; that is, who have been kind to the poor and hungry, all who have been happy while living on this earth. Any one who has been killed by accident, or who has committed suicide, certainly goes to the happy place.

All Inuit who have been bad—that is, unkind one to another—all who have been unhappy while on this earth, will go to Adliparmiut. If an Inung kills another because he is mad at him, he will certainly go to Adliparmiut.

Kumlien's remarks on this subject, as well as on other ethnographic subjects, are not trustworthy. He has transferred Greenland tales to Cumberland Sound, though the traditions of these tribes differ materially one from the other. I tried hard to corroborate his statements concerning the amaroq and the tornarsuq, concerning certain customs, &c., and am convinced that they are totally unknown to all the natives of Baffin Land from Nugumiut to Tununirn.

Kumlien states that the better land is below the surface of the earth and that those who are killed by violence descend after death. According to Hall and to replies to my own inquiries, it is quite the reverse. Lyon's report is extremely interesting, particularly his description of the stages of the nether world, of which I could only find a scanty hint in the names. He says (p. 372):

There are two places appointed to receive the souls of the good: one of these is in the center of the earth, the other in qilaq, or heaven. To the latter place, such as are drowned at sea, starved to death, murdered, or killed by walruses or bears, are instantly wafted, and dwell in a charming country, which, however, has never been seen by any angakoq. * * *

The place of souls in the world below is called Adli generally; but there are, properly, four distinct states of blessedness, and each rank has a world to itself, the lowest land being the last and best, which all hope to reach. The day on which a good person dies and is buried, the soul goes to a land immediately under the visible world; and, still descending, it arrives the second day at one yet lower; the third day it goes farther yet; and on the fourth it finds, "below the lowest deep, a deeper still." This is the "good land," and the soul which reaches it is for ever happy. The three first stages are bad uncomfortable places for in each the sky is so close to the earth, that a man cannot walk erect: yet these regions are inhabited; and the good soul, in passing through them, sees multitudes of the dead, who, having lost

their way, or, not being entitled to the "good land," are always wandering about and in great distress. Whether these unhappy souls are in purgatory or not, I was unable to learn; but they suffer no other pain than what we would call the "fidgets." In the lowest Adli a perpetual and delightful summer prevails.

The belief of these tribes undoubtedly is that all who die by accident or by violence and women who die in childbirth are taken to the upper world. I never heard a different opinion expressed by any native. I do not know whether they believe in a series of upper worlds similar to the nether worlds of the Iglulirmiut, but it is probable, from the names Qudlivun and Qudliparmiut. In the Greenland tradition the upper world is represented as a country with hills and valleys, over which the solid blue sky is expanded. Sedna of the Oqomiut lives in Adlivun, and here the souls must stay one year after death. Everybody who dies from disease or who has offended Sedna by infringing her orders is taken to her. The Eskimo are in great fear of the terrors of her abode. Murderers and offenders against human laws, after they have entered Sedna's house, will never leave it; the other souls, however, are taken to the Adliparmiut, where they live comparatively at their ease, although they are not nearly so blessed as the Qudliparmiut. They hunt whales and walrus and are almost always troubled by ice and snow.

The older authors on Greenland mythology state that the conceptions of the natives do not coincide (Cranz). According to one tradition the good land is below, and tornarsuq, the supreme tornaq, is master of it. Here continuous summer prevails and there is plenty of fresh water, with a profusion of game. Only those people are allowed to come here who have been good hunters and workers, who have accomplished great exploits, caught many seals, who have suffered much, or have died by violence or in childbirth. The souls of the deceased must slide for five days, or even longer, down a steep rock, which has become quite slippery from the blood which has been sprinkled over it. Those who have been lazy and unfit for working go to the upper world, where they suffer from scarcity of food. Particularly the bad and witches are taken to this country, where they are tormented by ravens.

Another tradition places the good land in heaven. The souls travel on the rainbow to the moon, near which they find a large lake abounding with fowls and fish. Rink gives the following statement on this subject (p. 37):

> After death, human souls either go to the upper or to the under world. The latter is decidedly to be preferred, as being warm and rich in food. There are the dwellings of the happy dead called arsissut,—viz, those who live in abundance. On the contrary, those who go to the upper world will suffer from cold and famine; and these are called the arssartut, or ball players, on account of their playing at ball with a walrus head, which gives rise to the aurora borealis.

While the Iglulirmiut believe that the soul leaves the body immediately after death and descends to Adli, the tribes of Davis Strait

suppose that it lingers three days around the body, unable to leave it. Then it descends to Sedna's house. During its stay in Adlivun the soul is called tupilaq, which is represented by the figure of a man with wide, loose, shabby clothing. It is looked upon as a malevolent spirit, frequently roaming around the villages. The tupilaq is not allowed to enter the houses, and if the angakoq perceives and announces his presence no one would dare to leave the houses. His touch kills men at once, the sight of him causes sickness and mischief. As soon as the soul has become an adliparmio, it is at rest and ceases to be feared as a tupilaq.

It is worth remarking that the Greenlanders designate with the name of tupilaq a supernatural being made by men for the purpose of destroying their enemies (Rink, p. 53). It is composed of various parts of different animals and is enabled to act in the shape of any of them at will. I have not found any trace of this idea among the Central Eskimo.

THE TORNAIT AND THE ANGAKUT.

A consideration of the religious ideas of the Eskimo shows that the tornait, the invisible rulers of every object, are the most remarkable beings next to Sedna. Everything has its inua (owner), which may become the genius of man who thus obtains the qualities of angakunirn. I am not quite sure that every inua can become the tornaq of a man, though with the Greenlanders this was possible. I learned of three kinds of spirits only, who are protectors of angakut: those in the shape of men, of stones, and of bears. These spirits enable the angakut to have intercourse with the others who are considered malevolent to mankind, and though those three species are kind to their angakut they would hurt strangers who might happen to see them. The bear seems to be the most powerful among these spirits. The tornait of the stones live in the large bowlders scattered over the country. The Eskimo believe that these rocks are hollow and form a nice house, the entrance of which is only visible to the angakoq whose genius lives in the stone. The tornaq is a woman with only one eye, in the middle of the brow. Another kind of tornaq lives in the stones that roll down the hills in spring when the snow begins to melt. If a native happens to meet such a stone, which is about to become his tornaq, the latter addresses him: "I jumped down in long leaps from my place on the cliff. As the snow melts, as water is formed on the hills, I jump down." Then it asks the native whether he is willing to have it for his tornaq, and if he answers in the affirmative it accompanies him, wabbling along, as it has no legs.

The bear tornaq is represented as a huge animal without any hair except on the points of the ears and of the tail and at the mouth. If a man wishes to obtain a bear for his tornaq he must travel all alone

to the edge of the land floe and summon the bears. Then a large herd will approach and frighten him almost to death. He falls down at once. Should he fall backward he would die at once. If he falls upon his face, however, one bear out of the herd steps forward and asks him if he wishes him to become his tornaq. He then recovers and takes the bear for his spirit and is accompanied by him on the return journey. On the way home, they pass a seal hole and the bear captures the animal for his master. The Eskimo is now a great angakoq, and whenever he wants help he is sure to get it from his bear.

The Eskimo do not make images of the tornait or other supernatural beings in whom they believe, but use to a great extent amulets (armgoaq), some of which are given by the tornait, while others are inherited. The most common varieties of amulets are the feather of an owl, a bear's tooth, and the like, which are always worn on the middle of the back of the inner jacket. Rare minerals (e. g., iron) sewed up in a piece of skin are sometimes used for the same purpose. A small part of the first gown worn by a child is considered a powerful amulet and is preserved for this reason. It is worn at the point of the hood at a great feast celebrated every fall (see pp. 604, 611) and is called koukparmiutang.

Lyon (p. 367) gives the following account of the use of amulets in Iglulik:

> Bones and teeth of animals, hanging as solitary pendants, or strung in great numbers, have peculiar virtues, and the bones of the feet of the kabliaqdjuq, which I imagine to be the wolverine, are the most in request. The front teeth of musk oxen are considered as jewels, while the grinders, one or two together, are much esteemed as tassels for the strings used to tie up the breeches of the women. Eye teeth of foxes are sometimes seen to the number of hundreds, neatly perforated and arranged as a kind of fringe round caps or dresses, and even the bones and teeth of fish have their value.
>
> Leather cases of the size of a quill, and containing small pieces of deer's or other flesh, are frequently attached to the caps or hoods of children, but whether to render them expert hunters, or to preserve their health, I could not discover. I was assured that broken spear heads, and other equally cumbrous pendants, worn round the necks of young girls, were spells for the preservation of their chastity, while the same ornaments caused the women to be prolific.

The principal office of the angakut is to find out the reason of sickness and death or of any other misfortune visiting the natives.

The Eskimo believes that he is obliged to answer the angakoq's questions truthfully. The lamps being lowered, the angakoq strips off his outer jacket, pulls the hood over his head, and sits down in the back part of the hut facing the wall. He claps his hands, which are covered with mittens, and, shaking his whole body, utters sounds which one would hardly recognize as human.

Thus he invokes his tornaq, singing and shouting alternately, the listeners, who sit on the edge of the bed, joining the chorus and

answering his questions. Then he asks the sick person: "Did you work when it was forbidden?" "Did you eat when you were not allowed to eat?" And if the poor fellow happens to remember any transgression of such laws, he cries: "Yes, I have worked." "Yes, I have eaten." And the angakoq rejoins "I thought so" and issues his commands as to the manner of atonement.

These are manifold. Exchange of wives between two men or adoption of a sick child by another family in order to save its life are frequently demanded. The inhabitants of a village are forbidden to wash themselves for a number of days, to scrape the ice from the windows, and to clean their urine pots before sunrise. Sometimes the angakoq commands that the clothing be thrown away or gives regulations for diet, particularly forbidding the eating of venison, working on deerskins, filing iron, &c.

Disorders of women are considered as a punishment for the neglect to observe the regulations referring to their behavior at certain periods, which regulations were established by Sedna. The same is stated by Lyon (p. 363).

A method of finding out the reason of a disease is by "head lifting." A thong is tied round the head of the sick person or of a relative, who must lie down on the bed, the angakoq holding the thong. Then he asks his tornaq the reason of the sickness and the remedy. If the tornaq answers a question of the angakoq in the affirmative the head is easily lifted. In the other case it feels so heavy that he is unable to move it. Another method is by lifting a boot or a stone, which has been placed under the pillow of the patient. The angakut believe that the boot or stone becomes heavy and cannot be lifted when the tornaq answers their incantations.

At the beginning of some of their performances I have observed the angakoq crawling about in the passage of the hut, howling and shouting, while those inside kept on singing. Then he entered the hut and continued the incantations on the back part of the bed.

Sometimes their cure for sickness is laying a piece of burning wick upon the diseased part of the body and blowing it up into the air or merely blowing upon it.

Storm and bad weather, when lasting a long time and causing want of food, are conjured by making a large whip of seaweed, stepping to the beach, and striking out in the direction whence the wind blows, at the same time crying Taba (It is enough).

A great number of the performances of the angakut require much skill and expertness. Thus in invoking a tornaq or flying to a distant place they can imitate a distant voice by a sort of ventriloquism. In these performances they always have the lamps extinguished and hide themselves behind a screen hung up in the back part of the hut. The tornaq, being invoked, is heard approaching and shaking the hut. The angakoq believes that it is unroofed and flies with

his spirit to their place of destination, to propitiate the wrath of a hostile tornaq, to visit the moon or Sedna's dismal abode.

Part of their performances might almost be called juggling. Hall (II, p. 101) describes one of these performances:

> The angakoq (Ar-too-a) now made use of three walrus spears. One of these he thrust into the wall of the snow house, and * * * ran with it outside of the igdlu [house] where his ejaculations were responded to by the party inside with the cries of "Atte ! Atte !" [Go on ! Go on !]. Returning with his spear to the door, he had a severe wrestling match with four of the men, who overcame him. But coming again into the central igdlu, and having the lights which had been at the first patted down, relit, he showed the points of two spears apparently covered with fresh blood, which he held up in the presence of all.

The performance of the angakut in the Sedna feast, which will be described hereafter (p. 604) is quite astonishing. Some pierce their bodies with harpoons, evidently having bladders filled with blood fastened under their jackets beforehand, and bleed profusely as they enter the hut. (See Appendix, Note 5.)

A memorable ceremony has been described by Hall (I, p. 469):

> I heard a loud shout just outside [the hut]. As quick as thought, the Eskimo sprang for the long knives lying around, and hid them wherever they could find places. * * * Immediately there came crawling into the low entrance to the hut a man with long hair completely covering his face and eyes. He remained on his knees on the floor of the hut, feeling round like a blind man at each side of the entrance, back of the firelight, the place where meat is usually kept, and where knives may generally be found. Not finding any, the angakoq slowly withdrew. * * * If he had found a knife he would have stabbed himself in the breast.

It is one of their favorite tricks to have their hands tied up and a thong fastened around their knees and neck. Then they begin invoking their tornaq, and all of a sudden the body lies motionless while the soul flies to any place which they wish to visit. After returning, the thongs are found untied, though they had been fastened by firm knots. The resemblance of this performance to the experiments of modern spiritualists is striking.

The angakut use a sacred language in their songs and incantations. A great number of words have a symbolic meaning, but others are old roots, which have been lost from common use in the lapse of time. These archaic words are very interesting from a linguistic point of view. Indeed, some are found which are still in use in Greenland, though lost in the other dialects, and others which are only used in Alaska.

I ought to add here that most of the angakut themselves believe in their performances, as by continued shouting and invoking they fall into an ecstasy and really imagine they accomplish the flights and see the spirits.

The angakoq, who must be paid at once for curing a sick person, receives pretty large fees for services of this kind.

Although witchcraft occupied a prominent place in the belief of the Greenlanders I could only find very faint traces of it in Baffin Land, to wit, the opinion that a man has the power of injuring a distant enemy by some means the details of which I did not learn.

I shall add here the numerous regulations referring to eating and working, many of which are connected with the Sedna tradition, and the observance of which is watched by the angakut. As all sea animals have originated from her fingers the Eskimo must make an atonement for every animal he kills. When a seal is brought into the hut the women must stop working until it is cut up. After the capture of a ground seal, walrus, or whale they must rest for three days. Not all kinds of work, however, are forbidden, for they are allowed to mend articles made of sealskin, but they must not make anything new. For instance, an old tent cover may be enlarged in order to build a larger hut, but it is not permitted to make a new one. Working on new deerskins is strictly forbidden. No skins of this kind obtained in summer may be prepared before the ice has formed and the first seal is caught with the harpoon. Later, as soon as the first walrus is caught, the work must stop again until the next fall. For this reason all families are eager to finish the work on deerskins as quickly as possible, as the walrusing season is not commenced until that is done.

The laws prohibiting contact with deer and sea animals at the same time are very strict. According to the Eskimo themselves Sedna dislikes the deer (probably for some reason connected with the tradition of its origin,) and therefore they are not allowed to bring it in contact with her favorites. The meat of the whale, seal, or walrus must not be eaten on the same day with venison. It is not permitted that both sorts of meat lie on the floor of the hut or behind the lamps at the same time. If a man who has eaten venison in the morning happens to enter a hut in which seal meat is being cooked he is allowed to eat venison on the bed, but it must be wrapped up before being carried into the hut and he must take care to keep clear of the floor. Before changing from one food to the other the Eskimo must wash themselves. For the same reason walrus hide must not be carried to Lake Nettilling, which is considered the domain of deer.

A similar custom requires that the Ukusiksalirmiut carry salmon into a hut by a separate entrance, for it must not pass through the same one as seal oil. Besides, the fish must only be cooked at the distance of a day's journey from the place where they have been caught. If eaten on the spot they must be eaten raw (Klutschak, p. 158).

Their customs referring to hunting are manifold. When skinning a deer they must not break a single bone; then they cut off bits of different parts of the animal and bury them in the ground or under stones (Hall I, p. 386). I have never noticed this custom myself.

On the west shore of Hudson Bay dogs are not allowed to gnaw deer bones during the deer hunting season or seal bones during the sealing season (Klutschak, p. 123). Deer bones must not be broken while walrus are hunted (Hall II, p. 155).

When the men go out hunting in their kayaks the women of the Aivillirmiut take a cup down to the shore and leave it there, believing that it will bring luck (Hall II, p. 103). On Davis Strait they throw a piece of seal's blubber on their husband's kayak when he is about to go hunting (Kumlien, p. 45). After the capture of a whale the Aivillirmiut are not allowed to burn shrubs, but use bones of the whale instead, which are mixed with blubber (Hall II, p. 364). If an animal that is with young is killed the fetus must not be taken and used for food (Hall II, p. 253). When a bear is caught the Nugumiut and the Oqomiut are accustomed to fasten its bladder to a stick which is placed upright near the hut or encampment for three days.

When a house is deserted the Aivillirmiut are in the habit of carrying all the bones lying inside to some distance and putting them upon the ice (Hall II, p. 175). If they intend to move to a place some distance away they are in the habit of burying some of their clothing. Klutschak observed this custom among the Netchillirmiut; I myself, among the Akudnirmiut. If a great number of families leave a village those who remain build new houses, as they believe that they would otherwise have bad luck in hunting.

A great number of regulations refer to the behavior of women during menstruation. They are not allowed to eat raw meat, they must cook in separate pots, and are not permitted to join in festivals, being looked upon as unclean during this period. Customs referring to childbirth and sickness will be found further on (see p. 609).

When a traveling party visits a neighboring tribe it is obliged to adopt the customs and regulations of the latter.

This account does not by any means include all the peculiar customs of these people, for they are so numerous and the difficulty of finding out anything pertaining to this subject is so great that it is probable that the greater part of them have escaped notice.

I shall also mention a few customs that are peculiar to certain places. At Qeqertelung, east of Naujateling, in Cumberland Sound, the Eskimo dig potstone, but must buy it from the rock: that is, having dug out a piece, they must give the rock something in exchange; for example, ivory carvings, beads, food, or the like.

At Arligaulik, near Wager River, the Eskimo address a large rock and bid it farewell when passing (Hall II, p. 174).

In Cumberland Sound there is a cape called Iliqimisarbing, i. e., the place of headshaking. The place is very dangerous, as heavy squalls sweep down the steep rocks and slides frequently occur. Therefore the natives never pass it without shaking their heads, at the same time uttering a deep murmur.

Besides the tornait already mentioned, a number of others are known which cannot become genii of men. A spirit of the sea, Kalopaling or Mitiling, is described in a tradition (see p. 620). In Erdmann's Wörterbuch des Labradordialectes "Mitiling" is translated Gespenst, i. e., ghost. No doubt it is the name of the same spirit or at least of a similar one which is recognized among the northern tribes, the literal translation being "with eider ducks." Another spirit of which the natives are in great fear is Qiqirn, a phantom in the shape of a huge dog almost without hair. Like the bear which has been alluded to, it has hair only at the mouth, the feet, and the points of the ears and the tail. If it comes near dogs or men they fall into fits and only recover when Qiqirn has left. It is exceedingly afraid of men and runs away as soon as an angakoq descries it.

A very remarkable tornaq is the qaggim inua, i. e., master of the dancing house. The natives build large houses for feasting, singing, and dancing, which are devoted to spirits. This tornaq has the shape of a bandy legged man, his knees being bent outward and forward. He has not a single hair upon his entire body and no bones at the back of his head. To touch him would result in immediate death (see p. 636).

Besides these tornait, more powerful supernatural beings are known, who are "owners" (inua) of the stars and constellations and of meteorologic processes. Moon and sun are considered brother and sister, and in this the tradition of the Central Eskimo exactly corresponds with that of the Greenlanders. It is even known among the Eskimo of Point Barrow (Simpson, p. 940). From Repulse Bay (Aivillirmiut) a few scanty traces of this tradition are recorded by Rae (I, p. 79). He relates as follows:

> It is said that many years ago, not long after the creation of the world, there was a mighty conjurer, who gained so much power that at last he raised himself up into the heavens, taking with him his sister (a beautiful girl) and a fire. To the latter he added great quantities of fuel, which thus formed the sun. For some time he and his sister lived in great harmony, but at last they disagreed, and he, in addition to maltreating the lady in many ways, at last scorched the side of her face. She had suffered patiently all sorts of indignities, but the spoiling of her beauty was not to be borne; she therefore ran away from him and formed the moon, and continues so until this day. Her brother is still in chase of her, but although he gets near, he will never overtake her. When it is new moon, the burnt side of the face is towards us; when full moon, the reverse is the case.

The following form of the legend, which I received from some Akudnirmiut and Oqomiut, is almost identical with the Greenland one:

In olden times a brother and his sister lived in a large village in which there was a singing house, and every night the sister with her playfellows enjoyed themselves in this house. Once upon a time, when all the lamps in the singing house were extinguished, somebody came in and outraged her. She was unable to recognize him; but

she blackened her hands with soot and when the same again happened besmeared the man's back with it. When the lamps were relighted she saw that the violator was her brother. In great anger she sharpened a knife and cut off her breasts, which she offered to him, saying: "Since you seem to relish me, eat this." Her brother fell into a passion and she fled from him, running about the room. She seized a piece of wood (with which the lamps are kept in order) which was burning brightly and rushed out of the house. The brother took another one, but in his pursuit he fell down and extinguished his light, which continued to glow only faintly. Gradually both were lifted up and continued their course in the sky, the sister being transformed into the sun, the brother into the moon. Whenever the new moon first appears she sings:

Aningaga tapika, takirn tapika qaumidjatedlirpoq; qaumatitaudle.
Aningaga tapika, tikipoq tapika.
(My brother up there, the moon up there begins to shine; he will be bright.
My brother up there, he is coming up there.)

THE FLIGHT TO THE MOON.

There exists another tradition in regard to the spirit of the moon, which is also known to the Greenlanders. While in the first tradition the moon is a man carrying a glowing light, in the other she is the moon man's house (Rink, p. 440). The legend, as told by the Oqomiut and Akudnirmiut, is the narrative of the flight of an angakoq to the moon and is as follows:

A mighty angakoq, who had a bear for his tornaq, resolved to pay a visit to the moon. He sat down in the rear of his hut, turning his back toward the lamps, which had been extinguished. He had his hands tied up and a thong fastened around his knees and neck. Then he summoned his tornaq, which carried him rapidly through the air and brought him to the moon. He observed that the moon was a house, nicely covered with white deerskins, which the man in the moon used to dry near it. On each side of the entrance was the upper portion of the body of an enormous walrus, which threatened to tear in pieces the bold intruder. Though it was dangerous to pass by the fierce animals, the angakoq, by help of his tornaq, succeeded in entering the house.

In the passage he saw the only dog of the man of the moon, which is called Tirie'tiang and is dappled white and red. On entering the main room he perceived, to the left, a small additional building, in which a beautiful woman, the sun, sat before her lamp. As soon as she saw the angakoq entering she blew her fire, behind the blaze of which she hid herself. The man in the moon came to meet him kindly, stepping from the seat on the ledge and bidding the stranger welcome. Behind the lamps great heaps of venison and seal meat were piled up, but the man of the moon did not yet offer him any-

thing. He said: "My wife, Ululiernang, will soon enter and we will perform a dance. Mind that you do not laugh, else she will slit open your belly with her knife, take out your intestines, and give them to my ermine which lives in yon little house outside."

Before long a woman entered carrying an oblong vessel in which her ulo (see p. 518) lay. She put it on the floor and stooped forward, turning the vessel like a whirligig. Then she commenced dancing, and when she turned her back toward the angakoq it was made manifest that she was hollow. She had no back, backbone, or entrails, but only lungs and heart.

The man joined her dance and their attitudes and grimaces looked so funny that the angakoq could scarcely keep from laughing. But just at the right moment he called to mind the warnings of the man in the moon and rushed out of the house. The man cried after him, "Uqsureliktaleqdjuin" ("Provide yourself with your large white bear tornaq").[1] Thus he escaped unhurt.

Upon another visit he succeeded in mastering his inclination to laugh and was hospitably received by the man after the performance was finished. He showed him all around the house and let him look into a small additional building near the entrance. There he saw large herds of deer apparently roaming over vast plains, and the man of the moon allowed him to choose one animal, which fell immediately through a hole upon the earth. In another building he saw a profusion of seals swimming in an ocean and was allowed to pick out one of these also. At last the man in the moon sent him away, when his tornaq carried him back to his hut as quickly as he had left it.

During his visit to the moon his body had lain motionless and soulless, but now it revived. The thongs with which his hands had been fastened had fallen down, though they had been tied in firm knots. The angakoq felt almost exhausted, and when the lamps were relighted he related to the eagerly listening men his adventures during his flight to the moon.

It is related in the course of this tradition that the man in the moon has a qaumat, some kind of light or fire, but I could not reach a satisfactory understanding of the meaning of this word. It is derived from qauq (daylight) and is used in Greenland for the moon herself. Among the Eskimo of Baffin Land it is only employed in the angakoq language, in which the moon is called qaumavun, the sun qaumativun. Another name of the moon is aninga (her brother), in reference to the first legend. The natives also believe that the man in the moon makes the snow. He is generally considered a protector of orphans and of the poor, and sometimes descends from his house on a sledge drawn by his dog, Tirie'tiang, in order to help them (see the tradition of Qaudjaqdjuq, p. 630).

[1] Uqsurelik, with blubber, signifies in the language of the angakut the white bear; lauk, large; -leqdjorpoq, he provides himself with.

KADLU THE THUNDERER.

It is said that three sisters make the lightning, the thunder, and the rain. The names of two of them are Ingnirtung (the one who strikes the fire) and Udluqtung (the one who rubs the skins), whose second name is Kadlu (thunder), while that of the third I could not ascertain. They live in a large house the walls of which are supported by whale ribs. It stands in the far west, at a great distance from the sea, as Kadlu and her sisters do not like to go near it. If an Eskimo should happen to enter the house he must hasten away or Ingnirtung will immediately kill him with her lightning. Even the stones are afraid of her and jump down the hills whenever they see the lightning and hear the thunder. The faces of the sisters are entirely black and they wear no clothes at all. (?) Ingnirtung makes the lightning by striking two red stones together (flint). Kadlu makes the thunder by rubbing sealskins and singing. The third sister makes the rain by urinating. They procure food by striking reindeer with the lightning, which singes their skins and roasts their flesh. The Akudnirmiut say that beyond Iglulik, on the continent of America, a large tribe of Eskimo live whom they call Kakī'joq. The women of the tribe are said to have rings tattooed round their eyes. These natives offer the dried skins of a species of small seals to Kadlu, who uses them for making the thunder.

FEASTS, RELIGIOUS AND SECULAR.

The Eskimo have some very interesting feasts, most of which are closely connected with their religious notions. In summer feasts are celebrated in the open air, but in winter a house, called qaggi, or, as we may call it, singing house, is built for that purpose.

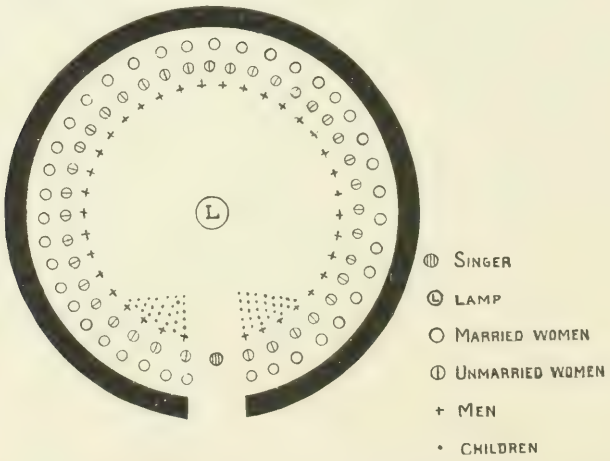


FIG. 531. Diagram showing interior of qaggi or singing house among eastern tribes.

The plan of the house which is used by the eastern tribes is represented in Fig. 531. It is a large snow dome about fifteen feet in

height and twenty feet in diameter, without any lining. In the center there is a snow pillar five feet high, on which the lamps stand. When the inhabitants of a village assemble in this building for singing and dancing the married women stand in a row next the wall. The unmarried women form a circle inside the former, while the men sit in the innermost row. The children stand in two groups, one at each side of the door. When the feast begins, a man takes up the drum (kilaut), which will be described presently, steps into the open space next the door, and begins singing and dancing. Among the stone foundations of Niutang, in Kingnait (Cumberland Sound), there is a qaggi built on the same plan as the snow structure. Probably it was covered with a snow roof when in use.

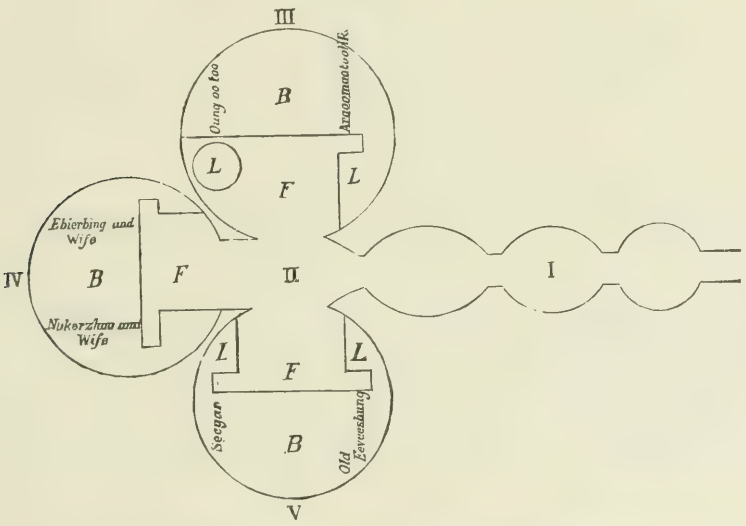


FIG. 532. Plan of Hudson Bay qaggi or singing house. (From Hall II, p. 220.)

Hall gives the plan of the Hudson Bay qaggi (Fig. 532), a copy of which is here introduced, as well as his description of the drum (Fig. 533), which I have never seen made (Hall II, p. 96):

The drum is made from the skin of the deer [or seal], which is stretched over a hoop made of wood, or of bone from the fin of a whale, by the use of a strong, braided cord of sinew passed around a groove on the outside. The hoop is about 2½ inches wide, 1½ inches thick, and 3 feet in diameter, the whole instrument weighing about 4 pounds. The wooden drumstick, 10 inches in length and 3 inches in diameter, is called a kentun. * * *

The deerskin which is to be the head of the instrument is kept frozen when not in use. It is then thoroughly saturated with water, drawn over the hoop, and temporarily fastened in its place by a piece of sinew. A line of heavy, twisted sinew, about 50 feet long, is now wound tightly on the groove on the outside of the hoop, binding down the skin. This cord is fastened to the handle of the kilaut [drum], which is made to turn by the force of several men (while its other end is

held firmly), and the line eased out as required. To do this a man sits on the bedplat orm, "having one or two turns of the line about his body, which is encased in furred deerskins, and empaled by four upright pieces of wood." Tension is secured by using a round stick of wood as a lever on the edge of the skin, drawing it from beneath the cord. When any whirring sound is heard, little whisps of reindeer hair are tucked in between the skin and the hoop, until the head is as tight as a drum.

FIG. 533. Kilaut or drum.

When the drum is played, the drum handle is held in the left hand of the performer, who strikes the edge of the rim opposite that over which the skin is stretched. He holds the drum in different positions, but keeps it in a constant fan-like motion by his hand and by the blows of the kentun struck alternately on the opposite sides of the edge. Skillfully keeping the drum vibrating on the handle, he accompanies this with grotesque motions of the body, and at intervals with a song, while the women keep up their own Inuit songs, one after another, through the whole performance.

The feast is described as follows:

As usual the women sat on the platform Turk fashion; the men, behind them with extended legs. The women were gayly dressed. They wore on each side of the face an enormous pigtail, made by wrapping their hair on a small wooden roller a foot in length; strips of reindeer-fur being wrapped with the hair [see p. 559]. These were black and white for those who had sons and black only for those who had none. Shining ornaments were worn on the head and on the breast they had masonic-like aprons, the groundwork of which was of a flaming red color, ornamented with glass beads of many colors.

In Cumberland Sound the women also wear pigtails at the celebration of these feasts. The drum is sometimes played with the wrist of the right hand instead of the beater.

Every singing house is dedicated to a tornaq, the qaggim inua, as mentioned above. For this reason all these performances may be considered religious feasts.

The songs are always composed by the singer himself. Satiric songs are great favorites on these occasions. While the men listen in silence the women join in the chorus, amna aya, the never failing

end of each verse. The dancer remains on one spot only, stamping rythmically with the feet, swinging the upper part of his body, and at the same time playing the kilaut. While dancing he always strips the upper part of the body, keeping on only trousers and boots. Singing and dancing are alternated with wrestling matches and playing at hook and crook. Almost every great success in hunting is celebrated in the qaggi, and especially the capture of a whale. Such a feast has been described by Parry.

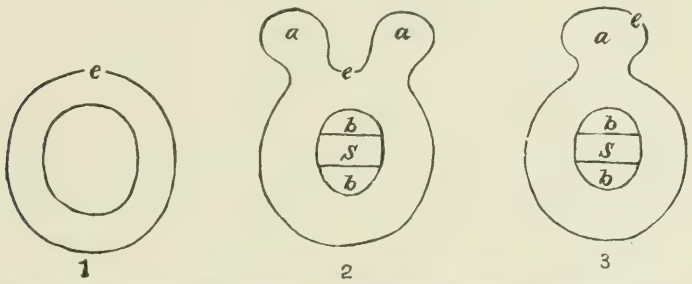


FIG. 534. Plans of remains of supposed qaggis or singing houses. (From Parry II, p. 362.)

The stone foundations observed by Parry and copied here (Fig. 534) are probably the remains of singing houses. Parry's description is as follows (II, p. 362):

It appears that the whole whale or a principal part of it is dragged into the enclosure, where some of the men are employed in cutting it up and throwing the pieces over the wall to the rest, who stand ready to receive them outside; while within the women range themselves in a circle around the whale and continue singing during the operation. * * * Each of these structures * * * was the distinct property of a particular individual; and had probably, in its turn, been the seat of feasting and merriment either to the present owner, or those from whom he had inherited it.

Great feasts closely connected with the Sedna tradition are celebrated every fall.

When late in the fall storms rage over the land and release the sea from the icy fetters by which it is as yet but slightly bound, when the loosened floes are driven one against the other and break up with loud crashes, when the cakes of ice are piled in wild disorder one upon another, the Eskimo believes he hears the voices of spirits which inhabit the mischief laden air.

The spirits of the dead, the tupilaq, knock wildly at the huts, which they cannot enter, and woe to the unhappy person whom they can lay hold of. He immediately sickens and a speedy death is regarded as sure to come. The wicked qiqirn pursues the dogs, which die with convulsions and cramps as soon as they see him. All the countless spirits of evil are aroused, striving to bring sickness and death, bad weather, and failure in hunting. The worst visitors are Sedna, mistress of the under world, and her father, to whose share the dead

Inuit fall. While the other spirits fill the air and the water, she rises from under the ground.

It is then a busy season for the wizards. In every hut we may hear them singing and praying; conjuring of the spirits is going on in every house. The lamps burn low. The wizard sits in a mystic gloom in the rear of the hut. He has thrown off his outer coat and drawn the hood of his inner garment over his head, while he mutters indescribable sounds, unnatural to a human voice. At last the guardian spirit responds to the invocation. The angakoq lies in a trance and when he comes to himself he promises in incoherent phrases the help of the good spirit against the tupilaq and informs the credulous, affrighted Inuit how they can escape from the dreaded ghosts.

The hardest task, that of driving away Sedna, is reserved for the most powerful angakoq. A rope is coiled on the floor of a large hut in such a manner as to leave a small opening at the top, which represents the breathing hole of a seal. Two angakut stand by the side of it, one of them holding the seal spear in his left hand, as if he were watching at the seal hole in the winter, the other holding the harpoon line. Another angakoq, whose office it is to lure Sedna up with a magic song, sits at the back of the hut. At last she comes up through the hard rocks and the wizard hears her heavy breathing; now she emerges from the ground and meets the angakoq waiting at the hole. She is harpooned and sinks away in angry haste, drawing after her the harpoon, to which the two men hold with all their strength. Only by a desperate effort does she tear herself away from it and return to her dwelling in Adlivun. Nothing is left with the two men but the blood sprinkled harpoon, which they proudly show to the Inuit.

Sedna and the other evil spirits are at last driven away, and on the following day a great festival for young and old is celebrated in honor of the event. But they must still be careful, for the wounded Sedna is greatly enraged and will seize any one whom she can find out of his hut; so on this day they all wear protecting amulets (koukparmiutang) on the tops of their hoods. Parts of the first garment which they wore after birth are used for this purpose.

The men assemble early in the morning in the middle of the settlement. As soon as they have all got together they run screaming and jumping around the houses, following the course of the sun (nunajisartung or kaivitijung). A few, dressed in women's jackets, run in the opposite direction. These are those who were born in abnormal presentations. The circuit made, they visit every hut, and the woman of the house must always be in waiting for them. When she hears the noise of the band she comes out and throws a dish containing little gifts of meat, ivory trinkets, and articles of sealskin into the yelling crowd, of which each one helps himself to what he can get. No hut is omitted in this round (irqatatung).

The crowd next divides itself into two parties, the ptarmigans (aχigirn), those who were born in the winter, and the ducks (aggirn), or the children of summer. A large rope of sealskin is stretched out. One party takes one end of it and tries with all its might to drag the opposite party over to its side. The others hold fast to the rope and try as hard to make ground for themselves. If the ptarmigans give way the summer has won the game and fine weather may be expected to prevail through the winter (nussueraqtung).

The contest of the seasons having been decided, the women bring out of a hut a large kettle of water and each person takes his drinking cup. They all stand as near the kettle as possible, while the oldest man among them steps out first. He dips a cup of water from the vessel, sprinkles a few drops on the ground, turns his face toward the home of his youth, and tells his name and the place of his birth (oχsoaχsavepunga ——me, I was born in ——). He is followed by an aged woman, who announces her name and home, and then all the others do the same, down to the young children, who are represented by their mothers. Only the parents of children born during the last year are forbidden to partake in this ceremony. As the words of the old are listened to respectfully, so those of the distinguished hunters are received with demonstrative applause and those of the others with varying degrees of attention, in some cases even with joking and raillery (imitijung).

Now arises a cry of surprise and all eyes are turned toward a hut out of which stalk two gigantic figures. They wear heavy boots; their legs are swelled out to a wonderful thickness with several pairs of breeches; the shoulders of each are covered by a woman's overjacket and the faces by tattooed masks of sealskins. In the right hand each carries the seal spear, on the back of each is an inflated buoy of sealskin, and in the left hand the scraper. Silently, with long strides, the qailertetang (Fig. 535) approach the assembly, who, screaming, press back from them. The pair solemnly lead the men to a suitable spot and set them in a row, and the women in another opposite them. They match the men and women in pairs and these pairs run, pursued by the qailertetang, to the hut of the woman, where they are for the following day and night man and wife (nulianitititijung). Having performed this duty, the qailertetang stride down to the shore and invoke the good north wind, which brings fair weather, while they warn off the unfavorable south wind.

As soon as the incantation is over, all the men attack the qailertetang with great noise. They act as if they had weapons in their hands and would kill both spirits. One pretends to probe them with a spear, another to stab them with a knife, one to cut off their arms and legs, another to beat them unmercifully on the head. The buoys which they carry on their backs are ripped open and collapse and soon they both lie as if dead beside their broken weapons (pilektung).

The Eskimo leave them to get their drinking cups and the qailertetang awake to new life. Each man fills his sealskin with water, passes a cup to them, and inquires about the future, about the fortunes of the hunt and the events of life. The qailertetang answer in murmurs which the questioner must interpret for himself.

FIG. 535. Qailertetang, a masked figure. (From a sketch by the author.)

The evening is spent in playing ball, which is whipped all around the settlement (ajuktaqtung). (See Appendix, Note 6.)

This feast is celebrated as here described in Cumberland Sound and Nugumiut. Hall and Kumlien make a few observations in regard to it, but the latter has evidently misunderstood its meaning. His description is as follows (p. 43):

An angakoq dresses himself up in the most hideous manner, having several pairs of pants on among the rest, and a horrid looking mask of skins. The men and women now range themselves in separate and opposite ranks, and the angakoq takes

his place between them. He then picks out a man and conducts him to a woman in the opposite ranks. This couple then go to the woman's hut and have a grand spree for a day or two. This manner of proceeding is kept up till all the women but one are disposed of. This one is always the angakoq's choice, and her he reserves for himself.

Another description by Kumlien (p. 19) evidently refers to the same feast:

They have an interesting custom or superstition, namely, the killing of the evil spirit of the deer; sometime during the winter or early in spring, at any rate before they can go deer hunting, they congregate together and dispose of this imaginary evil. The chief ancut [angakoq], or medicine man, is the main performer. He goes through a number of gyrations and contortions, constantly hallooing and calling, till suddenly the imaginary deer is among them. Now begins a lively time. Every one is screaming, runn ng, jumping, spearing, and stabbing at the imaginary deer, till one would think a whole madhouse was let loose. Often this deer proves very agile, and must be hard to kill, for I have known them to keep this performance up for days; in fact, till they were completely exhausted.

During one of these performances an old man speared the deer, another knocked out an eye, a third stabbed him, and so on till he was dead. Those who are able or fortunate enough to inflict some injury on this bad deer, especially he who inflicts the death blow, is considered extremely lucky, as he will have no difficulty in procuring as many deer as he wants, for there is no longer an evil spirit to turn his bullets or arrows from their course.

I could not learn anything about this ceremony, though I asked all the persons with whom Kumlien had had intercourse. Probably there was some misunderstanding as to the meaning of their feast during the autumn which induced him to give this report.

Hall describes the feast as celebrated by the Nugumiut (I, p. 528), as follows:

At a time of the year apparently answering to our Christmas, they have a general meeting in a large igdlu [snow house] on a certain evening. There the angakoq prays on behalf of the people for the public prosperity through the subsequent year. Then follows something like a feast. The next day all go out into the open air and form in a circle; in the centre is placed a vessel of water, and each member of the company brings a piece of meat, the kind being immaterial. The circle being formed, each person eats his or her meat in silence, thinking of Sedna, and wishing for good things. Then one in the circle takes a cup, dips up some of the water, all the time thinking of Sedna, and drinks it; and then, before passing the cup to another, states audibly the time and the place of his or her birth. This ceremony is performed by all in succession. Finally, presents of various articles are thrown from one to another, with the idea that each will receive of Sedna good things in proportion to the liberality here shown.

Soon after this occasion, at a time which answers to our New Year's day, two men start out, one of them being dressed to represent a woman, and go to every house in the village, blowing out the light in each. The lights are afterwards rekindled from a fresh fire. When Taqulitu [Hall's well known companion in his journeys] was asked the meaning of this, she replied, "New sun — new light," implying a belief that the sun was at that time renewed for the year.

Inasmuch as Hall did not see the feast himself, but had only a description by an Eskimo, into which he introduced points of similarity with Christian feasts, it may be looked upon as fairly agree-

ing with the feast of the Oqomiut. The latter part corresponds to the celebration of the feast as it is celebrated in Akudnirn.[1]

According to a statement in the journal of Hall's second expedition (II, p. 219) masks are also used on the western shore of Hudson Bay, where it seems that all the natives disguise themselves on this occasion.

The Akudnirmiut celebrate the feast in the following way: The qailertetang do not act a part there, but other masks take their place. They are called mirqussang and represent a man and his wife. They wear masks of the skin of the ground seal, only that of the woman being tattooed. The hair of the man is arranged in a bunch protruding from the forehead (sulubaut), that of the woman in a pigtail on each side and a large knot at the back of the head. Their left legs are tied up by a thong running around the neck and the knee, compelling them to hobble. They have neither seal float and spear nor inflated legs, but carry the skin scraper. They must try to enter the huts while the Inuit hold a long sealskin thong before them to keep them off. If they fall down in the attempt to cross it they are thoroughly beaten with a short whip or with sticks. After having succeeded in entering the huts they blow out all the fires.

The parts of the feast already described as celebrated in Cumberland Sound seem not to be customary in Akudnirn, the conjuration of Sedna and the exchanges of wives excepted, which are also practiced here. Sometimes the latter ceremony takes place the night before the feast. It is called suluiting or quvietung.

When it is quite dark a number of Inuit come out of their huts and run crying all round their settlements. Wherever anybody is asleep they climb upon the roof of his hut and rouse him by screaming and shouting until all have assembled outside. Then a woman and a man (the mirqussang) sit down in the snow. The man holds a knife (sulung) in his hand, from which the feast takes its name, and sings:

Oangaja jaja jajaja aja.
Pissiungmipadlo panginejernago
Qodlungutaokpan panginejerlugping
Pissiungmipadlo panginejernago.

To this song the woman keeps time by moving her body and her arms, at the same time flinging snow on the bystanders. Then the whole company goes into the singing house and joins in dancing and singing. This done, the men must leave the house and stand outside while the mirqussang watch the entrance. The women continue singing and leave the house one by one. They are awaited by the mirqussang, who lead every one to one of the men standing about. The pair must re-enter the singing house and walk around the lamp,

[1] Since the above was written I learn from a paper by Mr. Lucien M. Turner that a similar feast is celebrated in Ungava Bay. (American Naturalist, August, 1887.)

all the men and women crying, "Hrr! hrr!" from both corners of the mouth. Then they go to the woman's hut, where they stay during the ensuing night. The feast is frequently celebrated by all the tribes of Davis and Hudson Strait, and even independently of the great feast described above.

The day after, the men frequently join in a shooting match. A target is set up, at which they shoot their arrows. As soon as a man hits, the women, who stand looking on, rush forward and rub noses with him.

If a stranger unknown to the inhabitants of a settlement arrives on a visit he is welcomed by the celebration of a great feast. Among the southeastern tribes the natives arrange themselves in a row, one man standing in front of it. The stranger approaches slowly, his arms folded and his head inclined toward the right side. Then the native strikes him with all his strength on the right cheek and in his turn inclines his head awaiting the stranger's blow (tigluiqdjung). While this is going on the other men are playing at ball and singing (igdlukitaqtung). Thus they continue until one of the combatants is vanquished.

The ceremonies of greeting among the western tribes are similar to those of the eastern, but in addition "boxing, wrestling, and knife testing" are mentioned by travelers who have visited them. In Davis Strait and probably in all the other countries the game of "hook and crook" is always played on the arrival of a stranger (pakijumijartung). Two men sit down on a large skin, after having stripped the upper part of their bodies, and each tries to stretch out the bent arm of the other. These games are sometimes dangerous, as the victor has the right to kill his adversary; but generally the feast ends peaceably. The ceremonies of the western tribes in greeting a stranger are much feared by their eastern neighbors and therefore intercourse is somewhat restricted. The meaning of the duel, according to the natives themselves, is "that the two men in meeting wish to know which of them is the better man." The similarity of these ceremonies with those of Greenland, where the game of hook and crook and wrestling matches have been customary, is quite striking, as is that of the explanation of these ceremonies.

The word for greeting on Davis Strait and Hudson Strait, is Assojutidlin? (Are you quite well?) and the answer, Tabaujuradlu (Very well). The word Taima! which is used in Hudson Strait, and Mane taima! of the Netchillirmiut seem to be similar to our Halloo! The Ukusiksalirmiut say Ilaga! (My friend!)

CUSTOMS AND REGULATIONS CONCERNING BIRTH, SICKNESS, AND DEATH.

I have mentioned that it is extremely difficult to find out the innumerable regulations connected with the religious ideas and customs

of the Eskimo. The difficulty is even greater in regard to the customs which refer to birth, sickness, and death, and it is no wonder that, while some of the accounts of different writers coincide tolerably well, there are great discrepancies in others, particularly as the customs vary to a great extent among the different tribes.

Before the child is born a small hut or snow house is built for the mother, in which she awaits her delivery. Sick persons are isolated in the same way, the reason being that in case of death everything that had been in contact with the deceased must be destroyed. According to Kumlien (p. 28) the woman is left with only one attendant, a young girl appointed by the head ancut (angakoq) of the encampment; but this, no doubt, is an error. She may be visited by her friends, who, however, must leave her when parturition takes place. She must cut the navel string herself, and in Davis Strait this is done by tying it through with deer sinews; in Iglulik (Lyon, p. 370), by cutting it with a stone spear head. The child is cleaned with a birdskin and clothed in a small gown of the same material. According to Lyon the Iglulirmiut swathe it with the dried intestines of some animal.

Kumlien describes a remarkable custom of which I could find no trace, not even upon direct inquiry (p. 281):

> As soon as the mother with her new born babe is able to get up and go out, usually but a few hours, they are taken in charge by an aged female angakoq, who seems to have some particular mission to perform in such cases. She conducts them to some level spot on the ice, if near the sea, and begins a sort of march in circles on the ice, the mother following with the child on her back; this manœuvre is kept up for some time, the old woman going through a number of performances the nature of which we could not learn and continually muttering something equally unintelligible to us. The next act is to wade through snowdrifts, the aged angakoq leading the way. We have been informed that it is customary for the mother to wade thus bare-legged.

Lyon says (p. 370):

> After a few days, or according to the fancy of the parents, an angakoq, who by relationship or long acquaintance is a friend of the family, makes use of some vessel, and with the urine the mother washes the infant, while all the gossips around pour forth their good wishes for the little one to prove an active man, if a boy, or, if a girl, the mother of plenty of children. This ceremony, I believe, is never omitted, and is called qoqsiuariva.

Though I heard about the washing with urine, I did not learn anything about the rest of the ceremony in Cumberland Sound and Davis Strait.

A few days after birth the first dress of the child is exchanged for another. A small hood made from the skin of a hare's head is fitted snugly upon the head, a jacket for the upper part of the body is made of the skin of a fawn, and two small boots, made of the same kind of a skin, the left one being wreathed with seaweed (*Fucus*), cover the legs. While the child wears this clothing that which was first worn is fastened to a pole which is secured to the roof of the hut. In two

months the child gets a third suit of clothes the same as formerly described (p. 557). Then the second gown is exposed for some time on the top of the hut, the first one being taken down, and both are carefully preserved for a year. After this time has expired both are once more exposed on the top of a pole and then sunk into the sea, a portion of the birdskin dress alone being kept, for this is considered a powerful amulet and is held in high esteem and worn every fall at the Sedna feast on the point of the hood (see p. 604). I have stated that those who were born in abnormal presentations wear women's dresses at this feast and must make their round in a direction opposite to the movement of the sun. Captain Spicer, of Groton, Conn., affirms that the bird used for the first clothing is chosen according to a strict law, every month having its own bird. So far as I know, waterfowl are used in summer and the ptarmigan in winter, and accordingly the men are called at the great autumn feast the ducks and ptarmigans, the former including those who were born in summer, the latter those born in winter.

As long as any portion of the navel string remains a strip of sealskin is worn around the belly.

After the birth of her child the mother must observe a great number of regulations, referring particularly to food and work. She is not allowed for a whole year to eat raw meat or a part of any animal killed by being shot through the heart. In Cumberland Sound she must not eat for five days anything except meat of an animal killed by her husband or by a boy on his first hunting expedition. This custom seems to be observed more strictly, however, and for a longer period if the new born child dies. Two months after delivery she must make a call at every hut, while before that time she is not allowed to enter any but her own. At the end of this period she must also throw away her old clothing. The same custom was observed by Hall among the Nugumiut (I, p. 426). On the western shore of Hudson Bay she is permitted to re-enter the hut a few days after delivery, but must pass in by a separate entrance. An opening is cut for the purpose through the snow wall. She must keep a little skin bag hung up near her, into which she must put a little of her food after each meal, having first put it up to her mouth. This is called laying up food for the infant, although none is given to it (Hall II, p. 173). I have already mentioned that the parents are not allowed in the first year after the birth of a child to take part in the Sedna feast.

The customs which are associated with the death of an infant are very complicated. For a whole year, when outside the hut, the mother must have her head covered with a cap, or at least with a piece of skin. If a ground seal is caught she must throw away the old cap and have a new one made. The boots of the deceased are always carried about by the parents when traveling, and whenever they stop

these are buried in the snow or under stones. Neither parent is allowed to eat raw flesh during the following year. The woman must cook her food in a small pot which is exclusively used by her. If she is about to enter a hut the men who may be sitting inside must come out first, and not until they have come out is she allowed to enter. If she wants to go out of the hut she must walk around all the men who may happen to be there.

The child is sometimes named before it is born. Lyon says upon this subject (p. 369):

> Some relative or friend lays her hand on the mother's stomach, and decides what the infant is to be called, and, as the names serve for either sex, it is of no consequence whether it proves a girl or a boy.

On Davis Strait it is always named after the persons who have died since the last birth took place, and therefore the number of names of an Eskimo is sometimes rather large. If a relative dies while the child is younger than four years or so, his name is added to the old ones and becomes the proper name by which it is called. It is possible that children receive the names of all the persons in the settlement who die while the children are quite young, but of this I am not absolutely certain. When a person falls sick the angakut change his name in order to ward off the disease or they consecrate him as a dog to Sedna. In the latter event he gets a dog's name and must wear throughout life a harness over the inner jacket. Thus it may happen that Eskimo are known in different tribes by different names. It may also be mentioned here that friends sometimes exchange names and dogs are called by the name of a friend as a token of regard.

The treatment of the sick is the task of the angakoq, whose manipulations have been described.

If it is feared that a disease will prove fatal, a small snow house or a hut is built, according to the season, into which the patient is carried through an opening at the back. This opening is then closed, and subsequently a door is cut out. A small quantity of food is placed in the hut, but the patient is left without attendants. As long as there is no fear of sudden death the relatives and friends may come to visit him, but when death is impending the house is shut up and he is left alone to die. If it should happen that a person dies in a hut among its inmates, everything belonging to the hut must be destroyed or thrown away, even the tools &c. lying inside becoming useless to the survivors, but the tent poles may be used again after a year has elapsed. No doubt this custom explains the isolation of the sick. If a child dies in a hut and the mother immediately rushes out with it, the contents of the hut may be saved.

Though the Eskimo feel the greatest awe in touching a dead body, the sick await their death with admirable coolness and without the

least sign of fear or unwillingness to die. I remember a young girl who sent for me a few hours before her death and asked me to give her some tobacco and bread, which she wanted to take to her mother, who had died a few weeks before.

Only the relatives are allowed to touch the body of the deceased. They clothe it or wrap it in deerskins and bury it at once. In former times they always built a tomb, at least when death occurred in the summer. From its usual dimensions one would suppose that the body was buried with the legs doubled up, for all of them are too short for grown persons. If the person to be buried is young, his feet are placed in the direction of the rising sun, those of the aged in the opposite direction. According to Lyon the Iglulirmiut bury half grown children with the feet towards the southeast, young men and women with the feet towards the south, and middle aged persons with the feet towards the southwest. This agrees with the fact that the graves in Cumberland Sound do not all lie east and west. The tomb is always vaulted, as any stone or piece of snow resting upon the body is believed to be a burden to the soul of the deceased. The man's hunting implements and other utensils are placed by the side of his grave; the pots, the lamps, knives, &c., by the side of that of the woman; toys, by that of a child. Hall (I, p. 103) observed in a grave a small kettle hung up over a lamp. These objects are held in great respect and are never removed, at least as long as it is known to whose grave they belong. Sometimes models of implements are used for this purpose instead of the objects themselves. Figure 536 represents a model of a lamp found in a grave of Cumberland Sound. Nowadays the Eskimo place the body in a box, if they can procure one, or cover it very slightly with stones or snow. It is strange that, though the ceremonies of burying are very strictly attended to and though they take care to give the dead their belongings, they do not heed the opening of the graves by dogs or wolves and the devouring of the bodies and do not attempt to recover them when the graves are invaded by animals.

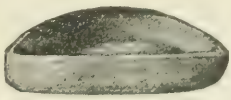


FIG. 536. Model of lamp from a grave in Cumberland Sound. (Museum für Völkerkunde, Berlin.)

The body must be carried to the place of burial by the nearest relatives, a few others only accompanying it. For this purpose they rarely avail themselves of a sledge, as it cannot be used afterward, but must be left with the deceased. Dogs are never allowed to drag the sledge on such an occasion. After returning from the burial the relatives must lock themselves up in the old hut for three days, during which they mourn the loss of the deceased. During this time

they do not dress their hair and they have their nostrils closed with a piece of deerskin. After this they leave the hut forever. The dogs are thrown into it through the window and allowed to devour whatever they can get at. For some time afterward the mourners must cook their meals in a separate pot. A strange custom was observed by Hall in Hudson Bay (II, p. 186). The mourners did not smoke. They kept their hoods on from morning till night. To the hood the skin and feathers of the head of *Uria grylle* were fastened and a feather of the same waterfowl to each arm just above the elbow. All male relatives of the deceased wore a belt around the waist, besides which they constantly wore mittens. It is probable that at the present time all Eskimo when in mourning avoid using implements of European manufacture and suspend the use of tobacco. It has already been stated that women who have lost a child must keep their heads covered.

Parry, Lyon (p. 369), and Klutschak (p. 201) state that when the Eskimo first hear of the death of a relative they throw themselves upon the ground and cry, not for grief, but as a mourning ceremony.

For three or sometimes even four days after a death the inhabitants of a village must not use their dogs, but must walk to the hunting ground, and for one day at least they are not allowed to go hunting at all. The women must stop all kinds of work.

On the third day after death the relatives visit the tomb and travel around it three times in the same direction as the sun is moving, at the same time talking to the deceased and promising that they will bring him something to eat. According to Lyon the Iglulirmiut chant forth inquiries as to the welfare of the departed soul, whether it has reached the land Adli, if it has plenty of food, &c., at each question stopping at the head of the grave and repeating some ceremonial words (p. 371).

These visits to the grave are repeated a year after death and whenever they pass it in traveling. Sometimes they carry food to the deceased, which he is expected to return greatly increased. Hall describes this custom as practiced by the Nugumiut (I, p. 426). He says:

> They took down small pieces of [deer] skin with the fur on, and of [fat]. When there they stood around [the] grave [of the woman] upon which they placed the articles they had brought. Then one of them stepped up, took a piece of the [deer meat], cut a slice and ate it, at the same time cutting off another slice and placing it under a stone by the grave. Then the knife was passed from one hand to the other, both hands being thrown behind the person. This form of shifting the implement was continued for perhaps a minute, the motions being accompanied by constant talk with the dead. Then a piece of [deer] fur and some [fat] were placed under the stone with an exclamation signifying, "Here is something to eat and something to keep you warm." Each of the [natives] also went through the same forms. They never visit the grave of a departed friend until some months after

death, and even then only when all the surviving members of the family have removed to another place. Whenever they return to the vicinity of their kindred's grave, a visit is made to it with the best of food as a present for the departed one. Neither seal, polar bear, nor walrus, however, is taken.

According to Klutschak (p. 154), the natives of Hudson Bay avoid staying a long time on the salt water ice near the grave of a relative.

On the fourth day after death the relatives may go for the first time upon the ice, but the men are not allowed to hunt; on the next day they must go sealing, but without dogs and sledge, walking to the hunting ground and dragging the seal home. On the sixth day they are at liberty to use their dogs again. For a whole year they must not join in any festival and are not allowed to sing certain songs.

If a married woman dies the widower is not permitted to keep any part of the first seal he catches after her death except the flesh. Skin, blubber, bones, and entrails must be sunk in the sea.

All the relatives must have new suits of clothes made and before the others are cast away they are not allowed to enter a hut without having asked and obtained permission. (See Appendix, Note 7.)

Lyon (p. 368) makes the following statement on the mourning ceremonies in Iglulik:

> Widows are forbidden for six months to taste of unboiled flesh; they wear no * * * pigtails, and cut off a portion of their long hair in token of grief, while the remaining locks hang in loose disorder about their shoulders. * * * After six months, the disconsolate ladies are at liberty to eat raw meat, to dress their pigtails and to marry as fast as they please; while in the meantime they either cohabit with their future husbands, if they have one, or distribute their favors more generally. A widower and his children remain during three days within the hut where his wife died, after which it is customary to remove to another. He is not allowed to fish or hunt for a whole season, or in that period to marry again. During the three days of lamentation all the relatives of the deceased are quite careless of their dress; their hair hangs wildly about, and, if possible, they are more than usually dirty in their persons. All visitors to a mourning family consider it as indispensably necessary to howl at their first entry.

I may add here that suicide is not of rare occurrence, as according to the religious ideas of the Eskimo the souls of those who die by violence go to Qudlivun, the happy land. For the same reason it is considered lawful for a man to kill his aged parents. In suicide death is generally brought about by hanging.

TALES AND TRADITIONS.

ITITAUJANG.

A long, long time ago, a young man, whose name was Ititaujang, lived in a village with many of his friends. When he became grown he wished to take a wife and went to a hut in which he knew an orphan girl was living. However, as he was bashful and was afraid to speak to the young girl himself, he called her little

brother, who was playing before the hut, and said, "Go to your sister and ask her if she will marry me." The boy ran to his sister and delivered the message. The young girl sent him back and bade him ask the name of her suitor. When she heard that his name was Ititaujang she told him to go away and look for another wife, as she was not willing to marry a man with such an ugly name.[1] But Ititaujang did not submit and sent the boy once more to his sister. "Tell her that Nettirsuaqdjung is my other name," said he. The boy, however, said upon entering, "Ititaujang is standing before the doorway and wants to marry you." Again the sister said "I will not have a man with that ugly name." When the boy returned to Ititaujang and repeated his sister's speech, he sent him back once more and said, "Tell her that Nettirsuaqdjung is my other name." Again the boy entered and said, "Ititaujang is standing before the doorway and wants to marry you." The sister answered, "I will not have a man with that ugly name." When the boy returned to Ititaujang and told him to go away, he was sent in the third time on the same commission, but to no better effect. Again the young girl declined his offer, and upon that Ititaujang went away in great anger. He did not care for any other girl of his tribe, but left the country altogether and wandered over hills and through valleys up the country many days and many nights.

At last he arrived in the land of the birds and saw a lakelet in which many geese were swimming. On the shore he saw a great number of boots; cautiously he crept nearer and stole as many as he could get hold of. A short time after the birds left the water and finding the boots gone became greatly alarmed and flew away. Only one of the flock remained behind, crying, "I want to have my boots; I want to have my boots." Ititaujang came forth now and answered, "I will give you your boots if you will become my wife." She objected, but when Ititaujang turned round to go away with the boots she agreed, though rather reluctantly.

Having put on the boots she was transformed into a woman and they wandered down to the seaside, where they settled in a large village. Here they lived together for some years and had a son. In time Ititaujang became a highly respected man, as he was by far the best whaler among the Inuit.

Once upon a time the Inuit had killed a whale and were busy cutting it up and carrying the meat and the blubber to their huts. Though Ititaujang was hard at work his wife stood lazily by. When he called her and asked her to help as the other women did she objected, crying, "My food is not from the sea; my food is from the land; I will not eat the meat of a whale; I will not help."

[1] Ititaujang means "similar to the anus." This tradition is curtailed, as some parts were considered inappropriate for this publication. The full text will be found in the Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, Berlin, 1888.

Itita ujang answered, "You must eat of the whale; that will fill your stomach." Then she began crying and exclaimed, "I will not eat it; I will not soil my nice white clothing."

She descended to the beach, eagerly looking for birds' feathers. Having found a few she put them between her fingers and between those of her child; both were transformed into geese and flew away.

When the Inuit saw this they called out, "Itita ujang, your wife is flying away." Itita ujang became very sad; he cried for his wife and did not care for the abundance of meat and blubber, nor for the whales spouting near the shore. He followed his wife and ascended the land in search of her.

After having traveled for many weary months he came to a river. There he saw a man who was busy chopping chips from a piece of wood with a large hatchet. As soon as the chips fell off he polished them neatly and they were transformed into salmon, becoming so slippery that they glided from his hands and fell into the river, which they descended to a large lake near by. The name of the man was Eχaluqdjung (the little salmon).

On approaching, Itita ujang was frightened almost to death, for he saw that the back of this man was altogether hollow and that he could look from behind right through his mouth. Cautiously he crept back and by a circuitous way approached him from the opposite direction.

When Eχaluqdjung saw him coming he stopped chopping and asked, "Which way did you approach me?" Itita ujang, pointing in the direction he had come last and from which he could not see the hollow back of Eχaluqdjung, answered, "It is there I have come from." Eχaluqdjung, on hearing this, said, "That is lucky for you. If you had come from the other side and had seen my back I should have immediately killed you with my hatchet." Itita ujang was very glad that he had turned back and thus deceived the salmon maker. He asked him, "Have you not seen my wife, who has left me, coming this way?" Eχaluqdjung had seen her and said, "Do you see yon little island in the large lake? There she lives now and has taken another husband."

When Itita ujang heard this report he almost despaired, as he did not know how to reach the island; but Eχaluqdjung kindly promised to help him. They descended to the beach; Eχaluqdjung gave him the backbone of a salmon and said, "Now shut your eyes. The backbone will turn into a kayak and carry you safely to the island. But mind you do not open your eyes, else the boat will upset."

Itita ujang promised to obey. He shut his eyes, the backbone became a kayak, and away he went over the lake. As he did not hear any splashing of water, he was anxious to see whether the boat moved on, and opened his eyes just a little. But he had scarcely taken a short glimpse when the kayak began to swing violently and he felt

that it became a backbone again. He quickly shut his eyes, the boat went steadily on, and a short time after he was landed on the island.

There he saw the hut and his son playing on the beach near it. The boy on looking up saw Ititaujang and ran to his mother crying, "Mother, father is here and is coming to our hut." The mother answered, "Go, play on; your father is far away and cannot find us." The child obeyed; but as he saw Ititaujang approaching he reentered the hut and said, "Mother, father is here and is coming to our hut." Again the mother sent him away, but he returned very soon, saying that Ititaujang was quite near.

Scarcely had the boy said so when Ititaujang opened the door. When the new husband saw him he told his wife to open a box which was in a corner of the hut. She did so, and many feathers flew out of it and stuck to them. The woman, her new husband, and the child were thus again transformed into geese. The hut disappeared; but when Ititaujang saw them about to fly away he got furious and cut open the belly of his wife before she could escape. Then many eggs fell down.

THE EMIGRATION OF THE SAGDLIRMIUT.

In the beginning all the Inuit lived near Ussualung, in Tiniqdjuarbing (Cumberland Sound). The Igdlumiut, the Nugumiut, and the Talirpingmiut in the south, the Aggomiut in the far north, and the Inuit, who tattoo rings round their eyes, in the far west, all once lived together. There is a tradition concerning the emigration of the Sagdlirmiut (see p. 451) who live east of Iglulik. The Akudnirmiut say that the following events did not happen in Tiniqdjuarbing, but in Aggo, a country where nobody lives nowadays. Ikeraping, an Akudnirmio, heard the story related by a Tununirmio, who had seen the place himself, but all the Oqomiut assert that Ussualung is the place where the events in the story happened.

An old woman, the sister of Mitiq, the angakoq, told the story as follows:

Near Ussualung there are two places, Qerniqdjuaq and Eχaluqdjuaq. In each of these was a large house, in which many families lived together. They used to keep company during the summer when they went deer hunting, but returned to their separate houses in the fall.

Once upon a time it happened that the men of Qerniqdjuaq had been very successful, while those of Eχaluqdjuaq had caught scarcely any deer. Therefore the latter got very angry and resolved to kill the other party, but they preferred to wait until the winter. Later in the season many deer were caught and put up in depots. They were to be carried down to the winter settlements by means of sledges.

One day both parties agreed upon a journey to these depots and the men of Eχaluqdjuaq resolved to kill their enemies on this occa-

sion. They set out with their dogs and sledges, and when they were fairly inland they suddenly attacked their unsuspecting companions and killed them. For fear that the wives and children of the murdered men might be suspicious if the dogs returned without their masters, they killed them too. After a short time they returned and said they had lost the other party and did not know what had happened to them.

A young man of Eχaluqdjuaq was the suitor of a girl of Qerniqdjuaq and used to visit her every night. He did not stop his visits now. He was kindly received by the woman and lay down to sleep with his young wife.

Under the snow bench there was a little boy who had seen the young man of Eχaluqdjuaq coming. When everybody was sleeping he heard somebody calling and soon recognized the spirits of the murdered men, who told him what had happened and asked him to kill the young man in revenge. The boy crept from his place under the bed, took a knife, and put it into the young man's breast. As he was a small boy and very weak, the knife glided from the ribs and entered deep into the heart, thus killing the young man.

Then he roused the other inhabitants of the hut and told them that the spirits of the dead men had come to him, that they had told him of their murder, and had ordered him to kill the young man. The women and children got very much frightened and did not know what to do. At last they resolved to follow the advice of an old woman and to flee from their cruel neighbors. As their dogs were killed, the sledges were of no use, but by chance a bitch with pups was in the hut and the old woman, who was a great angakoq, ordered them to go and whip the young dogs, which would thus grow up quickly. They did so and in a short time the pups were large and strong. They harnessed them and set off as quickly as possible. In order to deceive their neighbors they left everything behind and did not even extinguish their lamps, that they might not excite suspicion.

The next morning the men of Eχaluqdjuaq wondered why their companion had not returned and went to the hut in Qernirtung. They peeped through the spy hole in the window and saw the lamps burning, but nobody inside. At last they discovered the body of the young man, and, finding the tracks of the sledges, they hurriedly put their sledges in order and pursued the fugitives.

Though the latter had journeyed rapidly their pursuers followed still more rapidly and seemed likely to overtake them in a short time. They therefore became very much frightened, fearing the revenge of their pursuers.

When the sledge of the men drew near and the women saw that they were unable to escape, a young woman asked the old angakoq: "Don't you know how to cut the ice?" The matron answered in the affirmative and slowly drew a line over the ice with her first finger

across the path of their pursuers. The ice gave a loud crack. Once more she drew the line, when a crack opened and quickly widened as she passed on. The floe began moving and when the men arrived they could not cross over the wide space of water. Thus the party were saved by the art of their angakoq.

For many days they drifted to and fro, but finally they landed on the island of Sagdlirn, where they took up their abode and became the mothers of the Sagdlirmiut.

KALOPALING.

Kalopaling is a fabulous being that lives in the sea. His body is like that of a human being and he wears clothing made of eider ducks' skins. Therefore he is sometimes called Mitiling (with eider ducks). As these birds have a black back and a white belly, his gown looked speckled all over. His jacket has an enormous hood, which is an object of fear to the Inuit. If a kayak capsizes and the boatman is drowned Kalopaling puts him into this hood. He cannot speak, but can only cry, "Be, be! Be, be!" His feet are very large and look like inflated sealskin floats.

The Inuit believe that in olden times there were a great number of Kalopalit, but gradually their number diminished and there are now very few left. They may be seen from the land swimming very rapidly under the water and sometimes rising to the surface. While swimming they make a great noise by splashing with arms and legs. In summer they like to bask on rocks and in winter they sometimes sit on the ice near cracks or at the edge of drifting floes. As they pursue the hunters the most daring men try to kill them whenever they can get near them. Cautiously they approach the sleeping Kalopaling, and as soon as they come near enough they throw the walrus harpoon at him. They must shut their eyes immediately until the Kalopaling is dead, else he will capsize the boat and kill the hunters. The flesh of the Kalopaling is said to be poisonous, but good enough for dog's food.

An old tradition is handed down which refers to a Kalopaling:

An old woman lived with her grandson in a small hut. As they had no kinsmen they were very poor. A few Inuit only took pity on them and brought them seal's meat and blubber for their lamps. Once upon a time they were very hungry and the boy cried. The grandmother told him to be quiet, but as he did not obey she became angry and called Kalopaling to come and take him away. He entered at once and the woman put the boy into the large hood, in which he disappeared almost immediately.

Later on the Inuit were more successful in sealing and they had an abundance of meat. Then the grandmother was sorry that she had so rashly given the boy to Kalopaling and wished to see him back

again. She lamented about it to the Inuit, and at length a man and his wife promised to help her.

When the ice had consolidated and deep cracks were formed near the shore by the rise and fall of the tide, the boy used to rise and sit alongside the cracks, playing with a whip of seaweed. Kalopaling, however, was afraid that somebody might carry the boy away and had fastened him to a string of seaweed, which he held in his hands. The Inuit who had seen the boy went toward him, but as soon as he saw them coming he sang, "Two men are coming, one with a double jacket, the other with a foxskin jacket" (Inung maqong tikitong, aipa mirqosailing, aipa kapiteling). Then Kalopaling pulled on the rope and the boy disappeared. He did not want to return to his grandmother, who had abused him.

Some time afterward the Inuit saw him again sitting near a crack. They took the utmost caution that he should not hear them when approaching, tying pieces of deerskin under the soles of their boots. But when they could almost lay hold of the boy he sang, "Two men are coming, one with a double jacket, the other with a foxskin jacket." Again Kalopaling pulled on the seaweed rope and the boy disappeared.

The man and his wife, however, did not give up trying. They resolved to wait near the crack, and on one occasion when the boy had just come out of the water they jumped forward from a piece of ice behind which they had been hidden and before he could give the alarm they had cut the rope and away they went with him to their huts.

The boy lived with them and became a great hunter.

THE UISSUIT.

Besides the Kalopalit there are the Uissuit, a strange people that live in the sea. They are dwarfs and are frequently seen between Iglulik and Netchillik, where the Anganidjen live, an Inuit tribe whose women are in the habit of tattooing rings around their eyes. There are men and women among the Uissuit and they live in deep water, never coming up to the surface. When the Inuit wish to see them, they go in their boats to a place where they cannot see the bottom and try to catch them by hooks which they slowly move up and down. As soon as they get a bite they draw in the line. The Uissuit are thus drawn up; but no sooner do they approach the surface than they dive down headlong again, only their legs having emerged from the water. The Inuit have never succeeded in getting one out of the water.

KIVIUNG.

An old woman lived with her grandson in a small hut. As she had no husband and no son to take care of her and the boy, they were very poor, the boy's clothing being made of skins of birds which

they caught in snares. When the boy would come out of the hut and join his playfellows, the men would laugh at him and tear his outer garment. Only one man, whose name was Kiviung, was kind to the young boy; but he could not protect him from the others. Often the lad came to his grandmother crying and weeping, and she always consoled him and each time made him a new garment. She entreated the men to stop teasing the boy and tearing his clothing, but they would not listen to her prayer. At last she got angry and swore she would take revenge upon his abusers, and she could easily do so, as she was a great angakoq.

She commanded her grandson to step into a puddle which was on the floor of the hut, telling him what would happen and how he should behave. As soon as he stood in the water the earth opened and he sank out of sight, but the next moment he rose near the beach as a yearling seal with a beautiful skin and swam about lustily.

The men had barely seen the seal when they took to their kayaks, eager to secure the pretty animal. But the transformed boy quickly swam away, as his grandmother had told him, and the men continued in pursuit. Whenever he rose to breathe he took care to come up behind the kayaks, where the men could not get at him with their harpoons; there, however, he splashed and dabbled in order to attract their attention and lure them on. But before any one could turn his kayak he had dived again and swam away. The men were so interested in the pursuit that they did not observe that they were being led far from the coast and that the land was now altogether invisible.

Suddenly a gale arose; the sea foamed and roared and the waves destroyed or upset their frail vessels. After all seemed to be drowned the seal was again transformed into the lad, who went home without wetting his feet. There was nobody now to tear his clothing, all his abusers being dead.

Only Kiviung, who was a great angakoq and had never abused the boy, had escaped the wind and waves. Bravely he strove against the wild sea, but the storm did not abate. After he had drifted for many days on the wide sea, a dark mass loomed up through the mist. His hope revived and he worked hard to reach the supposed land. The nearer he came, however, the more agitated did the sea become, and he saw that he had mistaken a wild, black sea, with raging whirlpools, for land. Barely escaping he drifted again for many days, but the storm did not abate and he did not see any land. Again he saw a dark mass looming up through the mist, but he was once more deceived, for it was another whirlpool which made the sea rise in gigantic waves.

At last the storm moderated, the sea subsided, and at a great distance he saw the land. Gradually he came nearer and following the

coast he at length spied a stone house in which a light was burning. He landed and entered the house. Nobody was inside but an old woman whose name was Arnaitiang. She received him kindly and at his request pulled off his boots, slippers, and stockings and dried them on the frame hanging over the lamp. Then she went out to light a fire and cook a good meal.

When the stockings were dry, Kiviung tried to take them from the frame in order to put them on, but as soon as he extended his hand to touch them the frame rose out of his reach. Having tried several times in vain, he called Arnaitiang and asked her to give him back the stockings. She answered: "Take them yourself; there they are; there they are" and went out again. The fact is she was a very bad woman and wanted to eat Kiviung.

Then he tried once more to take hold of his stockings, but with no better result. He called again for Arnaitiang and asked her to give him the boots and stockings, whereupon she said: "Sit down where I sat when you entered my house; then you can get them." After that she left him again. Kiviung tried it once more, but the frame rose as before and he could not reach it.

Now he understood that Arnaitiang meditated mischief; so he summoned his tornaq, a huge white bear, who arose roaring from under the floor of the house. At first Arnaitiang did not hear him, but as Kiviung kept on conjuring the spirit came nearer and nearer to the surface, and when she heard his loud roar she rushed in trembling with fear and gave Kiviung what he had asked for. "Here are your boots," she cried; "here are your slippers; here are your stockings. I'll help you put them on." But Kiviung would not stay any longer with this horrid witch and did not even dare to put on his boots, but took them from Arnaitiang and rushed out of the door. He had barely escaped when it clapped violently together and just caught the tail of his jacket, which was torn off. He hastened to his kayak without once stopping to look behind and paddled away. He had only gone a short distance before Arnaitiang, who had recovered from her fear, came out swinging her glittering woman's knife and threatening to kill him. He was nearly frightened to death and almost upset his kayak. However, he managed to balance it again and cried in answer, lifting up his spear: "I shall kill you with my spear." When Arnaitiang heard these words she fell down terror stricken and broke her knife. Kiviung then observed that it was made of a thin slab of fresh water ice.

He traveled on for many days and nights, following the shore. At last he came to a hut, and again a lamp was burning inside. As his clothing was wet and he was hungry, he landed and entered the house. There he found a woman who lived all alone with her daughter. Her son-in-law was a log of driftwood which had four boughs. Every day about the time of low water they carried it to

the beach and when the tide came in it swam away. When night came again it returned with eight large seals, two being fastened to every bough. Thus the timber provided its wife, her mother, and Kiviung with an abundance of food. One day, however, after they had launched it as they had always done, it left and never returned.

After a short interval Kiviung married the young widow. Now he went sealing every day himself and was very successful. As he thought of leaving some day, he was anxious to get a good stock of mittens (that his hands might keep dry during the long journey?). Every night after returning from hunting he pretended to have lost his mittens. In reality he had concealed them in the hood of his jacket.

After awhile the old woman became jealous of her daughter, for the new husband of the latter was a splendid hunter and she wished to marry him herself. One day when he was away hunting, she murdered her daughter, and in order to deceive him she removed her daughter's skin and crept into it, thus changing her shape into that of the young woman. When Kiviung returned, she went to meet him, as it had been her daughter's custom, and without exciting any suspicion. But when he entered the hut and saw the bones of his wife he at once became aware of the cruel deed and of the deception that had been practiced and fled away.

He traveled on for many days and nights, always following the shore. At last he again came to a hut where a lamp was burning. As his clothing was wet and he was hungry, he landed and went up to the house. Before entering it occurred to him that it would be best to find out first who was inside. He therefore climbed up to the window and looked through the peep hole. On the bed sat an old woman, whose name was Aissivang (spider). When she saw the dark figure before the window she believed it was a cloud passing the sun, and as the light was insufficient to enable her to go on with her work she got angry. With her knife she cut away her eyebrows, ate them, and did not mind the dripping blood, but sewed on. When Kiviung saw this he thought that she must be a very bad woman and turned away.

Still he traveled on days and nights. At last he came to a land which seemed familiar to him and soon he recognized his own country. He was very glad when he saw some boats coming to meet him. They had been on a whaling excursion and were towing a great carcass to the village. In the bow of one of them stood a stout young man who had killed the whale. He was Kiviung's son, whom he had left a small boy and who was now grown up and had become a great hunter. His wife had taken a new husband, but now she returned to Kiviung.

ORIGIN OF THE NARWHAL.

A long, long time ago a widow lived with her daughter and her son in a hut. When the boy was quite young he made a bow and arrows of walrus tusks and shot birds, which they ate. Before he was grown up he accidentally became blind. From that moment his mother maltreated him in every way. She never gave him enough to eat, though he had formerly added a great deal to their sustenance, and did not allow her daughter, who loved her brother tenderly, to give him anything. Thus they lived many years and the poor boy was very unhappy.

Once upon a time a polar bear came to the hut and thrust his head right through the window. They were all very much frightened and the mother gave the boy his bow and arrows that he might kill the animal. But he said, "I cannot see the window and I shall miss him." Then the sister leveled the bow and the boy shot and killed the bear. The mother and sister went out and took the carcass down and skinned it.

After they had returned into the hut they told the boy that he had missed the bear, which had run away when it had seen him taking his bow and arrows. The bad mother had strictly ordered her daughter not to tell that the bear was dead, and she did not dare to disobey. The mother and the daughter ate the bear and had an ample supply of food, while the boy was almost starving. Sometimes, when the mother had gone away, the girl gave her brother something to eat, as she loved him dearly.

One day a loon flew over the hut and observing the poor blind boy it resolved to restore his eyesight. It sat down on the top of the roof and cried, "Come out, boy, and follow me." When he heard this he crept out and followed the bird, which flew along to a lake. There it took the boy and dived with him to the bottom. When they had risen again to the surface it asked, "Can you see anything?" The boy answered, "No, I cannot yet see." They dived again and staid a long time in the water. When they emerged, the bird asked, "Can you see now?" The boy answered, "I see a dim shimmer." Then they dived the third time and staid very long under water. When they had risen to the surface the boy had recovered his eyesight altogether.

He was very glad and thankful to the bird, which told him to return to the hut. Then he found the skin of the bear he had killed drying in the warm rays of the sun. He got very angry and cut it into small pieces. He entered the hut and asked his mother: "From whom did you get the bearskin I saw outside of the hut?" The mother was frightened when she found that her son had recovered his eyesight, and prevaricated. She said, "Come here, I will give

you the best I have; but I am very poor; I have no supporter; come here, eat this, it is very good." The boy, however, did not comply and asked again, "From whom did you get yon bearskin I saw outside the hut?" Again she prevaricated; but when she could no longer evade the question she said, "A boat came here with many men in it, who left it for me."

The boy did not believe the story, but was sure that it was the skin of the bear he had killed during the winter. However, he did not say a word. His mother, who was anxious to conciliate him, tried to accommodate him with food and clothing, but he did not accept anything.

He went to the other Inuit who lived in the same village, made a spear and a harpoon of the same pattern he saw in use with them, and began to catch white whales. In a short time he had become an expert hunter.

By and by he thought of taking revenge on his mother. He said to his sister, "Mother abused me when I was blind and has maltreated you for pitying me; we will revenge ourselves on her." The sister agreed and he planned a scheme for killing the mother.

When he went to hunt white whales he used to wind the harpoon line round his body and, taking a firm footing, hold the animal until it was dead. Sometimes his sister accompanied him and helped him to hold the line.

One day he told his mother to go with him and hold his line. When they came to the beach he tied the rope round her body and asked her to keep a firm footing. She was rather anxious, as she had never done this before, and told him to harpoon a small dolphin, else she might not be able to resist the strong pull. After a short time a young animal came up to breathe and the mother shouted, "Kill it, I can hold it;" but the boy answered, "No, it is too large." Again a small dolphin came near and the mother shouted to him to spear it; but he said, "No, it is too large." At last a huge animal rose quite near. Immediately he threw his harpoon, taking care not to kill it, and tossing his mother forward into the water cried out, "That is because you maltreated me; that is because you abused me."

The white whale dragged the mother into the sea, and whenever she rose to the surface she cried, "Louk! Louk!" and gradually she became transformed into a narwhal.

After the young man had taken revenge he began to realize that it was his mother whom he had murdered and he was haunted by remorse, and so was his sister, as she had agreed to the bad plans of her brother. They did not dare to stay any longer in their hut, but left the country and traveled many days and many nights overland. At last they came to a place where they saw a hut in which a man lived whose name was Qitua'jung. He was very bad and had horribly long nails on his fingers. The young man, being very thirsty,

sent his sister into the hut to ask for some water. She entered and said to Qitua'jung, who sat on the bed place, "My brother asks for some water;" to which Qitua'jung responded, "There it stands behind the lamp. Take as much as you like." She stooped to the bucket, when he jumped up and tore her back with his long nails. Then she called to her brother for help, crying, "Brother, brother, that man is going to kill me." The young man ran to the hut immediately, broke down the roof, and killed the bad man with his spear.

Cautiously he wrapped up his sister in hares' skins, put her on his back, and traveled on. He wandered over the land for many days, until he came to a hut in which a man lived whose name was Iqignang. As the young man was very hungry, he asked him if he might eat a morsel from the stock of deer meat put up in the entrance of the hut. Iqignang answered, "Don't eat it, don't eat it." Though he had already taken a little bit, he immediately stopped. Iqignang was very kind to the brother and sister, however, and after a short time he married the girl, who had recovered from her wounds, and gave his former wife to the young man.[1]

THE VISITOR.

An old hag lived in a house with her grandson. She was a very bad woman who thought of nothing but playing mischief. She was a witch and tried to harm everybody by witchcraft. Once upon a time a stranger came to visit some friends who lived in a hut near that of the old woman. As the visitor was a good hunter and procured plenty of food for his hosts, she envied them and resolved to kill the new comer. She made a soup of wolf's and man's brains, which was the most poisonous meal she could prepare, and sent her grandson to invite the stranger. She cautioned him not to say what she had cooked, as she knew that the visitor was a great angakoq, who was by far her superior in wisdom.

The boy went to the neighboring hut and said: "Stranger, my grandmother invites you to come to her hut and to have there a good feast on a supper she has cooked. She told me not to say that it is a man's and a wolf's brains and I do not say it."

Though the angakoq understood the schemes of the old hag he followed the boy and sat down with her. She feigned to be very glad to see him and gave him a dish full of soup, which he began to eat. But by help of his tornaq the food fell right through him into a vessel which he had put between his feet on the floor of the hut. This he gave to the old witch and compelled her to eat it. She died as soon as she had brought the first spoonful to her mouth.

[1] See foot-note on p. 616.

THE FUGITIVE WOMEN.

Once upon a time two women who were with child quarreled with their husbands and fled from their families and friends to live by themselves. After having traveled a long distance they came to a place called Igdluqdjuaq, where they resolved to stay. It was summer when they arrived. They found plenty of sod and turf and large whale ribs bleaching on the beach. They erected a firm structure of bones and filled the interstices with sod and turf. Thus they had a good house to live in. In order to obtain skins they made traps, in which they caught foxes in sufficient numbers for their dresses. Sometimes they found carcasses of ground seals or of whales which had drifted to the shore, of which they ate the meat and burnt the blubber. There was also a deep and narrow deer pass near the hut. Across this they stretched a rope and when the deer passed by they became entangled in it and strangled themselves. Besides, there was a salmon creek near the house and this likewise furnished them with an abundance of food.

In winter their fathers came in search of their lost daughters. When they saw the sledge coming they began to cry, as they were unwilling to return to their husbands. The men, however, were glad to find them comfortable, and having staid two nights at their daughters' house they returned home, where they told the strange story that two women without the company of any men lived all by themselves and were never in want.

Though this happened a long time ago the house may still be seen and therefore the place is called Igdluqdjuaq (The Large House).

QAUDJAQDJUQ.

I. STORY OF THE THREE BROTHERS.

A long time ago there lived three brothers. Two of them were grown up, but the third was a young lad whose name was Qaudjaqdjuq. The elder brothers had left their country and traveled about many years, while the youngest lived with his mother in their native village. As they had no supporter, the poor youth was abused by all the men of the village and there was nobody to protect him.

At last the elder brothers, being tired of roaming about, returned home. When they heard that the boy had been badly used by all the Inuit they became angry and thought of revenge. At first, however, they did not say anything, but built a boat, in which they intended to escape after having accomplished their designs. They were skillful boat builders and finished their work very soon. They tried the boat and found that it passed over the water as swiftly as an eider duck flies. As they were not content with their work they destroyed it again and built a new boat, which proved as swift as

an ice duck. They were not yet content, destroyed this, and built a third one that was good. After having finished the boat they lived quietly with the other men. In the village there was a large singing house, which was used at every festival. One day the three brothers entered it and shut it up. Then they began dancing and singing and continued until they were exhausted. As there was no seat in the house they asked their mother to bring one, and when they opened the door to let her pass in, an ermine, which had been hidden in the house, escaped.

Near the singing house the other Inuit of the village were playing. When they saw the ermine, which ran right through the crowd, they endeavored to catch it. In the eagerness of pursuit one man, who had almost caught the little animal, stumbled over a bowlder and fell in such a manner that he was instantly killed. The ermine was sprinkled with blood, particularly about its mouth. During the ensuing confusion it escaped into the singing house, where it concealed itself again in the same corner.

The brothers, who were inside, had recommenced singing and dancing. When they were exhausted they called for their mother (to bring something to eat). When they opened the door the ermine again escaped and ran about among the Inuit, who were still playing outside.

When they saw it they believed that the brothers would induce them to pursue it again, and thus make them perish one by one. Therefore the whole crowd stormed the singing house with the intention of killing the brothers. As the door was shut they climbed on the roof and pulled it down, but when they took up their spears to pierce the three men they opened the door and rushed down to the beach. Their boat was quite near at hand and ready to be launched, while those of the other Inuit were a long distance off.

They embarked with their mother, but, when they were at a short distance and saw that the other men had not yet reached their boats, they pretended that they were unable to move theirs, though they pulled with the utmost effort. In reality, they played with the oars on the water. A few young women and girls were on the shore looking at the brothers, who seemed to exert themselves to the utmost of their strength. The eldest brother cried to the women: "Will you help us? We cannot get along alone." Two girls consented, but as soon as they had come into the boat the brothers commenced pulling as hard as possible, the boat flying along quicker than a duck, while the girls cried with fright. The other Inuit hastened up desirous to reach the fugitives, and soon their boats were manned.

The brothers were not afraid, however, as their boat was by far the swiftest. When they had almost lost sight of the pursuers they were suddenly stopped by a high, bold land rising before the boat and shutting up their way. They were quite puzzled, as they had to

retrace their way for a long distance and feared they would be overtaken by the other boats. But one of the brothers, who was a great angakoq, saved them by his art. He said: "Shut your eyes and do not open them before I tell you, and then pull on." They did as they were bade, and when he told them to look up they saw that they had sailed right through the land, which rose just as high and formidable behind them as it had formerly obstructed their way. It had opened and let them pass.

After having sailed some time they saw a long black line in the sea. On coming nearer they discovered that it was an impenetrable mass of seaweed, so compact that they could leave the boat and stand upon it. There was no chance of pushing the boat through, though it was swifter than a duck. The eldest brother, however, thought of his angakoq art and said to his mother, "Take your hair lace and whip the seaweed." As soon as she did so it sank and opened the way.

After having overcome these obstacles they were troubled no more and accomplished their journey in safety. When they arrived in their country they went ashore and erected a hut. The two women whom they had taken from their enemies they gave to their young brother Qaudjaqdjuq.

They wanted to make him a very strong man, such as they were themselves. For this reason they led him to a huge stone and said, "Try to lift that stone." As Qaudjaqdjuq was unable to do so, they whipped him and said, "Try it again." Now Qaudjaqdjuq could move it a little from its place. The brothers were not yet content and whipped him once more. By the last whipping he became very strong and lifted the bowlder and cast it over the hut.

Then the brothers gave him the whip and told him to beat his wives if they disobeyed him.

II. QAUDJAQDJUQ.

A long time ago there was a poor little orphan boy who had no protector and was maltreated by all the inhabitants of the village. He was not even allowed to sleep in the hut, but lay outside in the cold passage among the dogs, who were his pillows and his quilt. Neither did they give him any meat, but flung old, tough walrus hide at him, which he was compelled to eat without a knife. A young girl was the only one who pitied him. She gave him a very small piece of iron for a knife, but bade him conceal it well or the men would take it from him. He did so, putting it into his urethra. Thus he led a miserable life and did not grow at all, but remained poor little Qaudjaqdjuq. He did not even dare to join the plays of the other children, as they also maltreated and abused him on account of his weakness.

When the inhabitants assembled in the singing house Qaudjaqdjuq used to lie in the passage and peep over the threshold. Now and then a man would lift him by the nostrils into the hut and give him the large urine vessel to carry out (Fig. 537). It was so large and heavy

FIG. 537. Qaudjaqdjuq is maltreated by his enemies. Drawn by Qeqertuqdjuaq, an Oqomio.

FIG. 538. The man in the moon comes down to help Qaudjaqdjuq..

that he was obliged to take hold of it with both hands and his teeth. As he was frequently lifted by the nostrils they grew to be very large, though he remained small and weak.

FIG. 539. The man in the moon whipping Qaudjaqdjuq.

FIG. 540. Qaudjaqdjuq has become Qaudjuqdjuaq.

At last the man in the moon,[1] who had seen how badly the men behaved towards Qaudjaqdjuq, came down to help him. He harnessed his dog[2] (Fig. 538) Tirie'tiang to his sledge and drove down. When near the hut he stopped and cried, "Qaudjaqdjuq, come out." Qaudjaqdjuq answered, "I will not come out. Go away!" But when he had asked him a second and a third time to come out, he complied, though he was very much frightened. Then the man in the moon went with him to a place where some large bowlders were lying about and, having whipped him (Fig. 539), asked, "Do you feel stronger now?" Qaudjaqdjuq answered: "Yes, I feel stronger." "Then lift yon bowlder," said he. As Qaudjaqdjuq was not yet able to lift it, he gave him another whipping, and now all of a sudden he began to grow, the feet first becoming of an extraordinary size (Fig. 540). Again the man in the moon asked him: "Do you feel stronger now?" Qaudjaqdjuq answered: "Yes, I feel stronger;" but as he could not yet lift the stone he was whipped once more, after which he had attained a very great strength and lifted the bowlder as if it were a small pebble. The man in the moon said: "That will do. To-morrow morning I shall send three bears; then you may show your strength."

He returned to the moon, but Qaudjaqdjuq, who had now become Qaudjuqdjuaq (the big Qaudjaqdjuq), returned home tossing the stones with his feet and making them fly to the right and to the left. At night he lay down again among the dogs to sleep. Next morning he awaited the bears, and, indeed, three large animals soon made their appearance, frightening all the men, who did not dare to leave the huts.

Then Qaudjuqdjuaq put on his boots and ran down to the ice. The men who looked out of the window hole said, "Look here, is

[1] The man in the moon is the protector of orphans.

[2] By a mistake of the Eskimo who made the drawings, four dogs are harnessed to the sledge. According to his own explanation the dappled one ought to be the only dog.

not that Qaudjaqdjuq? The bears will soon make way with him." But he seized the first by its hind legs and smashed its head on an iceberg, near which it happened to stand. The other one fared no better: the third, however, he carried up to the village and slew some of his persecutors with it. Others he pressed to death with his hands or tore off their heads (Fig. 541), crying: "That is for abusing me; that is for your maltreating me." Those whom he did not kill ran away, never to return. Only a few who had been kind to him while he had been poor little Qaudjaqdjuq were spared, among them the girl who had given him the knife. Qaudjuqdjuaq lived to be a great hunter and traveled all over the country, accomplishing many exploits.

FIG. 541. Qaudjuqdjuaq killing his enemies.

IGIMARASUGDJUQDJUAQ THE CANNIBAL.

Igimarasugdjuqdjuaq was a very huge and bad man, who had committed many murders and eaten the victims after he had cut them up with his knife. Once upon a time his sister-in-law came to visit his wife, but scarcely had she entered the hut before Igimarasugdjuqdjuaq killed her and commanded his wife to cook her.

His wife was very much frightened, fearing that she herself would be the next victim, and resolved to make her escape. When Igimarasugdjuqdjuaq had left to go hunting she gathered heather, stuffed her jacket with it, and placed the figure in a sitting position upon the bed. Then she ran away as fast as she could and suc-

ceeded in reaching a village. When her husband came home and saw the jacket he believed that it was a stranger who had come to visit him and stabbed him through the body. When he discovered, however, that his wife had deceived and left him, he fell into a passion and pursued her.

He came to the village and said: "Have you seen my wife? She has run away." The Inuit did not tell him that she was staying with them, but concealed her from his wrath. At last Igimarasugdjuqdjuaq gave her up for lost and returned home.

The Inuit, however, resolved to revenge the many outrages which he had wrought upon them. They went to visit him and met him on the ice just below the hut. When he told them he was going bear hunting they said: "Let us see your spear." This spear had a stout and sharp walrus tusk for a point. "Ah," said they; "that is good for bear hunting; how sharp it is. You must hit him just this way." And so saying they struck his brow, the point of the spear entering his brain, and then cut the body up with their knives.

THE TORNIT.[1]

In olden times the Inuit were not the only inhabitants of the country in which they live at the present time. Another tribe similar to them shared their hunting ground. But they were on good terms, both tribes living in harmony in the villages. The Tornit were much taller than the Inuit and had very long legs and arms. Almost all of them were blear eyed. They were extremely strong and could lift large bowlders, which were by far too heavy for the Inuit. But even the Inuit of that time were much stronger than those of to-day, and some large stones are shown on the plain of Miliaqdjuin, in Cumberland Sound, with which the ancient Inuit used to play, throwing them great distances. Even the strongest men of the present generations are scarcely able to lift them, much less to swing them or throw them any distance.

FIG. 542. Tumiujang or lamp of the Tornit. (Museum für Völkerkunde, Berlin IV, A 6848.)

The Tornit lived on walrus, seals, and deer, just as the Eskimo do nowadays, but their methods of hunting were different. The principal part of their winter dress was a long and wide coat of deerskins,

[1] See foot-note on p. 616.

similar to the jumper of the Eskimo, but reaching down to the knees and trimmed with leather straps. When sealing in winter they wore this garment, the lower edge of which was fastened on the snow by means of pegs. Under the jacket they carried a small lamp, called tumiujang (literally, resembling a footprint) or quming (Fig. 542), over which they melted snow in a small pot. Some Eskimo say that they opened the seals as soon as they were caught and cooked some meat over these lamps. When the seal blew in the hole they whispered, "Kapatipara" (I shall stab it) and, when they had hit it, "Igdluiliq." Frequently they forgot about the lamp and in throwing the harpoon upset it and burned their skin.

All their weapons were made of stone. For the blades of their knives they used green slate (uluqsaq, literally material for women's knives), which was fastened by ivory pins to a bone or ivory handle.

The points of their harpoons were made of bone, ivory, or slate; those of their lances, of flint or quartz, which was also used for drill-heads; and they made neither kayaks nor bows.

Their method of hunting deer was remarkable. In a deer pass, where the game could not escape, they erected a file of cairns across the valley and connected them by ropes. Some of the hunters hid behind the cairns, while others drove the deer toward them. As the animals were unable to pass the rope they fled along it, looking for an exit, and while attempting to pass a cairn were lanced by the waiting hunter, who seized the body by the hind legs and drew it behind the line.

This tale is related as a proof of their enormous strength and it is said that they were able to hold a harpooned walrus as the Eskimo hold a seal.

The Tornit could not clean the sealskins so well as the Inuit, but worked them up with part of the blubber attached. Their way of preparing meat was disgusting, since they let it become putrid and placed it between the thigh and the belly to warm it.

The old stone houses of the Tornit can be seen everywhere. Generally they did not build snow houses, but lived the whole winter in stone buildings, the roofs of which were frequently supported by whale ribs. Though the Eskimo built similar structures they can be easily distinguished from one another, the bed of their huts being much larger than that of the Tornit.

Though both tribes lived on very good terms, the Inuit did not like to play at ball with the Tornit, as they were too strong and used large balls, with which they hurt their playfellows severely.

A remarkable tradition is told referring to the emigration of this people.

The Tornit did not build any kayaks, but as they were aware of the advantages afforded by their use in hunting they stole the boats from the Inuit, who did not dare to defend their property, the

Tornit being by far their superiors in strength. Once upon a time a young Tuniq had taken the kayak of a young Inung without asking him and had injured it by knocking in the bottom. The Inung got very angry and ran a knife into the nape of the Tuniq's neck while he was sleeping. (According to another tradition he drilled a hole into his head; this form is also recorded in Labrador.) The Tornit then became afraid that the Inuit would kill them all and preferred to leave the country for good. They assembled at Qernirtung (a place in Cumberland Sound), and in order to deceive any pursuers they cut off the tails of their jumpers and tied their hair into a bunch protruding from the crown of the head.

In another form of the tradition it is said that while playing with the Tornit a young Inung fell down and broke his neck. The Tornit feared that the Inuit might take revenge upon them and left the country.

Many old ditties are sung which either treat of the Tornit or are reported to have been sung by them. Some of them will be found in the linguistic account connected with my journey.

THE WOMAN AND THE SPIRIT OF THE SINGING HOUSE.

Once upon a time a woman entered the singing house when it was quite dark. For a long time she had wished to see the spirit of the house, and though the Inuit had warned her of the impending danger she had insisted upon her undertaking.

She summoned the spirit, saying, "If you are in the house, come here." As she could not see him, she cried, "No spirit is here; he will not come." But the spirit, though yet invisible, said, "Here I am; there I am." Then the woman asked, "Where are your feet; where are your shins; where are your thighs; where are your hips; where are your loins?" Every time the spirit answered, "Here they are; there they are." And she asked further, "Where is your belly?" "Here it is," answered the spirit. "Where is your breast; where are your shoulders; where is your neck; where is your head?" "Here it is; there it is;" but in touching the head the woman all of a sudden fell dead. It had no bones and no hair (p. 597).

THE CONSTELLATION UDLEQDJUN.

Three men went bear hunting with a sledge and took a young boy with them. When they approached the edge of the floe they saw a bear and went in pursuit. Though the dogs ran fast they could not get nearer and all of a sudden they observed that the bear was lifted up and their sledge followed. At this moment the boy lost one of his mittens and in the attempt to pick it up fell from the sledge. There he saw the men ascending higher and higher, finally being transformed into stars. The bear became the star Nanuqdjung

(Betelgeuse); the pursuers, Udleqdjun (Orion's belt); and the sledge, Kamutiqdjung (Orion's sword). The men continue the pursuit up to this day; the boy, however, returned to the village and told how the men were lost.

ORIGIN OF THE ADLET AND OF THE QADLUNAIT.

Savirqong, an old man, lived alone with his daughter. Her name was Niviarsiang (i. e., the girl), but as she would not take a husband she was also called Uinigumissuitung (she who would not take a husband). She refused all her suitors, but at last a dog, spotted white and red, whose name was Ijirqang, won her affection and she took him for a husband. They had ten children, five of whom were Adlet and five dogs. The lower part of the body of the Adlet was that of a dog and hairy all over, the soles excepted, while the upper part was that of a man. When the children grew up they became very voracious, and as the dog Ijirqang did not go out hunting at all, but let his father in law provide for the whole family, it was difficult for Savirqong to feed them. Moreover, the children were awfully clamorous and noisy; so at last the grandfather got tired of it, put the whole family into his boat, and carried them to a small island. He told the dog Ijirqang to come every day and fetch meat.

Niviarsiang hung a pair of boots round his neck and he swam across the narrow channel. But Savirqong, instead of giving him meat, filled the boots with heavy stones, which drowned Ijirqang when he attempted to return to the island.

The daughter thought of revenging the death of her husband. She sent the young dogs to her father's hut and let them gnaw off his feet and hands. In return Savirqong, when Niviarsiang happened to be in his boat, threw her overboard and cut off her fingers when she held to the gunwale. As they fell into the sea they were transformed into seals and whales. At last he allowed her to climb into the boat.

As she feared that her father might think of killing or maiming her children, she ordered the Adlet to go inland, where they became the ancestors of a numerous people. She made a boat for the young dogs, setting up two sticks for masts in the soles of her boots, and sent the puppies across the ocean. She sang: "Angnaijaja. When you arrive there across the ocean you will make many things giving you joy. Angnaija." They arrived in the land beyond the sea and became the ancestors of the Europeans.

THE GREAT FLOOD.

A long time ago the ocean suddenly began to rise, until it covered the whole land. The water even rose to the top of the mountains and the ice drifted over them. When the flood had subsided the ice

stranded and ever since forms an ice cap on the top of the mountains. Many shellfish, fish, seal, and whales were left high and dry and their shells and bones may be seen to this day. A great number of Inuit died during this period, but many others, who had taken to their kayaks when the water commenced to rise, were saved.

INUGPAQDJUQDJUALUNG.[1]

In days of yore, an enormous man, whose name was Inugpaqdjuqdjualung, lived in company with many other Inuit in a village on a large fjord. He was so tall that he could straddle the fjord. He used to stand thus every morning and wait for whales to pass beneath him. As soon as one came along he stooped and caught it, just as another man would scoop up some little thing that had fallen into the water, and he ate it as other men eat a small piece of meat.

One day all the natives had manned their boats to hunt a whale. Inugpaqdjuqdjualung at the time was sitting lazily near his hut, but when he saw the efforts of the men he scooped both whale and boats from the water and placed them upon the beach.

At another time, being tired from running about, he lay down on a high hill to take a nap. The Inuit told him that a couple of huge bears had been seen near the village, but he said he didn't care, and told his friends to rouse him by throwing large stones upon him if they should see the bears coming. They did so and Inugpaqdjuqdjualung, suddenly starting up, cried: "Where are they? Where are they?" When the Inuit pointed them out he said: "What! those little things? Those are not worth the bustle; they are small foxes, not bears," and he crushed one between his fingers, while he put the other into the eyelet of his boot and strangled it there.

THE BEAR STORY.

This story is reprinted from Hall (II, p. 240):

Many moons ago, a woman obtained a polar bear cub but two or three days old. Having long desired just such a pet, she gave it her closest attention, as though it were a son, nursing it, making for it a soft warm bed alongside her own, and talking to it as a mother does to her child. She had no living relative, and she and the bear occupied the house alone. Kunikdjuaq, as he grew up, proved that the woman had not taught him in vain, for he early began to hunt seals and salmon, bringing them to his mother before eating any himself, and receiving his share from her hands. She always watched from the hilltop for his return, and if she saw that he had been unsuccessful, she begged from her neighbors blubber for his food. She learned how this was from her lookout, for if successful, he came back in the tracks made on going out, but if unsuccessful always by a different route. Learning to excel the Inuit in hunting, he excited their envy, and, after long years of faithful service, his death was resolved upon. On hearing this, the old woman, overwhelmed with grief, offered to give up her own life if they would but spare him who had so long supported her. Her offer was sternly refused. Upon this, when all his ene-

[1] See foot-note on p. 616.

mies had retired to their houses, the woman had a long talk with her son — now well grown in years — telling him that wicked men were about to kill him, and that the only way to save his life and hers was for him to go off and not return. At the same time she begged him not to go so far that she could not wander off and meet him, and get from him a seal or something else which she might need. The bear, after listening to what she said with tears streaming down her furrowed cheeks, gently placed one huge paw on her head, and then throwing both around her neck, said, 'Good mother, Kunikdjuaq will always be on the lookout for you and serve you as best he can." Saying this, he took her advice and departed, almost as much to the grief of the children of the village as to the mother.

Not long after this, being in need of food, she walked out on the sea ice to see if she could not meet her son, and soon recognized him as one of two bears who were lying down together. He ran to her, and she patted him on the head in her old familiar way, told him her wants, and begged him to hurry away and get something for her. Away ran the bear, and in a few moments the woman looked upon a terrible fight going on between him and his late companion, which, however, to her great relief, was soon ended by her son's dragging a lifeless body to her feet. With her knife she quickly skinned the dead bear, giving her son large slices of the blubber, and telling him that she would soon return for the meat, which she could not at first carry to her house, and when her supply should again fail she would come back for his help. This she continued to do for "a long, long time," the faithful bear always serving her and receiving the same unbroken love of his youth.

SUNDRY TALES.

(1) Two little girls, while playing about a cliff near Aivillik, with infants in the hoods on their backs, went into an opening between the rocks, which closed upon them before escape was possible. All attempts at rescue were unsuccessful, and the poor children, to whom for a time meat and water were passed, perished in the cliffs (Hall II, p. 222).

(2) Opposite to Niutang, a village in Kingnait, Cumberland Sound, there is a vein of diorite resembling a boot, and therefore called Kamingujang. A long time ago two enemies lived in the village. One day they stood on the beach ready to go hunting. Suddenly the one exclaimed, pointing to Kamingujang, "There he blows," making his enemy believe that a whale was passing up the fjord and inducing him to look out for it. Then he killed him from behind, piercing him with the spear.

(3) At Qognung, near the head of Nettilling Fjord, there is a large white stone on each side of the fjord, somewhat resembling a bear. It is said that these stones have been bears which, being pursued by an Eskimo in the water, escaped to the land, but were transformed into these stones.

(4) A long time ago a dead boy was buried under a large stone. Before his relatives had returned to their hut the body was transformed into a hare, which jumped forth from the tomb. All hares come from this animal.

(5) It is said that albinos of seals and deer spring from an egg of about half a foot in length, which forms itself in the earth. The seal digs an underground passage to the sea, the deer a similar one to a distant part of the country, and there they rise. The albinos are said to be very quick.

I will add here an enumeration of the fabulous tribes of which I gained intelligence, but of some of them I only know the names.

(1) The Tornit, or, as they are called by the Akudnirmiut, the Tuniqdjuait (p. 634). It is remarkable that this people is considered here, as well as in Labrador, a tribe similar to the Eskimo, with whom they formerly lived in company, but who were subsequently expelled by the latter. In Greenland they are entirely a fabulous tribe, each individual being of enormous size, living inland and seldom hunting in the upper parts of the fjords. While in the western parts of the Eskimo country a more historical form of the tradition is preserved, it is entirely mythical in Greenland.

(2) The Adlet or Erqigdlit. In the tradition treating of this tribe a similar change occurs. The Labrador Eskimo call the Indians of the interior Adlet, the tribes west of Hudson Bay call them Erqigdlit. The Baffin Land Eskimo and the Greenlanders have forgotten this relation altogether, but denote with the term a fabulous tribe with dogs' legs and a human body. The name Adla is used as far north as Cumberland Peninsula, the Akudnirmiut and the more northern tribes using the term Erqigdlit. It is difficult to account for the use of these different terms in both senses.

(3) The Ardnainiq, a tribe living in the extreme northwest. The men of this people are small, tiny, like children, but entirely covered with hair. They are carried about in the hoods of their wives, just like children. The women are of normal size. They do all the work, going out hunting in the kayaks and providing for the men.

(4) The Inuarudligang, dwarfs living in the cliffs near the shore.

(5) The Igdlungajung, a bandy legged people living inland.

(6) The Uissuit, dwarfs living in the depth of the sea (p. 621).

(7) The Ijirang.

(8) The Qailerte'tang, a people consisting of women only (p. 605).

Finally, I will mention the animals which are only known to the natives by reports of foreign tribes and are described as fabulous creatures. These are the umingmang (the musk ox), which is represented as a fierce animal with black and red streaks and larger than a bear, and the agdlaq (the black bear), which, according to their belief, is also of enormous size. It is said to live inland and to devour everything that comes near it. I am unable to decide whether the report of an enormous fish, the idluk, which is said to live in the lakes, is altogether fabulous. The natives say that if they want to catch the fish they build a snow house on the lake and cut a hole through the ice, into which they sink the hook with a deer's ham for

a bait and a stout thong for a fishing line. Six men hold the line by turns, and as soon as they feel the fish has nibbled they pull it up with all their strength.

The fabulous amaroq and avignaq of the Greenlanders are unknown, but the terms denote real animals, the wolf and the lemming.

Besides traditions of this kind the Eskimo have a great number of fables. Following is an example.

THE OWL AND THE RAVEN.

The owl and the raven were fast friends. One day the raven made a new dress, dappled white and black, for the owl, who in return made a pair of boots of whalebone for the raven and then began to make a white dress. But when he was about to try it on, the raven kept hopping about and would not sit still. The owl got angry and said: "Now sit still or I shall pour out the lamp over you." As the raven continued hopping about, the owl fell into a passion and poured the oil upon it. Then the raven cried "Qaq! Qaq!" and since that day has been black all over.

COMPARISON BETWEEN BAFFIN LAND TRADITIONS AND THOSE OF OTHER TRIBES.

The similarity of the language and traditions of the Eskimo from Behring Strait to Greenland is remarkable, considering the distance which separates the tribes. Unfortunately the material from other tribes, except the Greenlanders, is very scanty, but it is probable that the same traditions or elements of traditions are known to all the tribes. In the following table the above traditions are compared with Rink's Tales and Traditions of the Greenlanders and with those of other tribes:

Traditions of Greenlanders and other tribes:	Traditions of the Central Eskimo:
Qagsaqsuq, Rink, p. 93.	Qaudjaqdjuq, p. 630.
The blind man who recovered his sight, Rink, p. 99.	The origin of the narwhal, p. 625.
Igimarasugsuq, Rink, p. 106.	Igimarasugdjuqdjuaq, p. 633.
The man who mated himself with a sea fowl, Rink, p. 145.	Ititaujang, p. 615.
Givioq, Rink, pp. 157 and 429.	Kiviung, p. 621.
Tiggaq, Rink, p. 162.	The visitor, p. 627.
A lamentable story, Rink, p. 239.	No. 1, sundry tales, p. 639.
The sun and the moon, Rink, p. 236. (L'homme lunaire, Petitot, Traditions indiennes du Canada Nord-Ouest, p. 7. Also found by Simpson at Point Barrow.)	The sun and the moon, p. 597.

The moon, Rink, p. 440.
The Tornit (from Labrador), Rink, p. 469.
A woman who was mated with a dog, Rink, p. 471.
(Fragmentary in J. Murdoch: "A few legendary fragments from the Point Barrow Eskimos," American Naturalist, p. 594, July, 1886.)

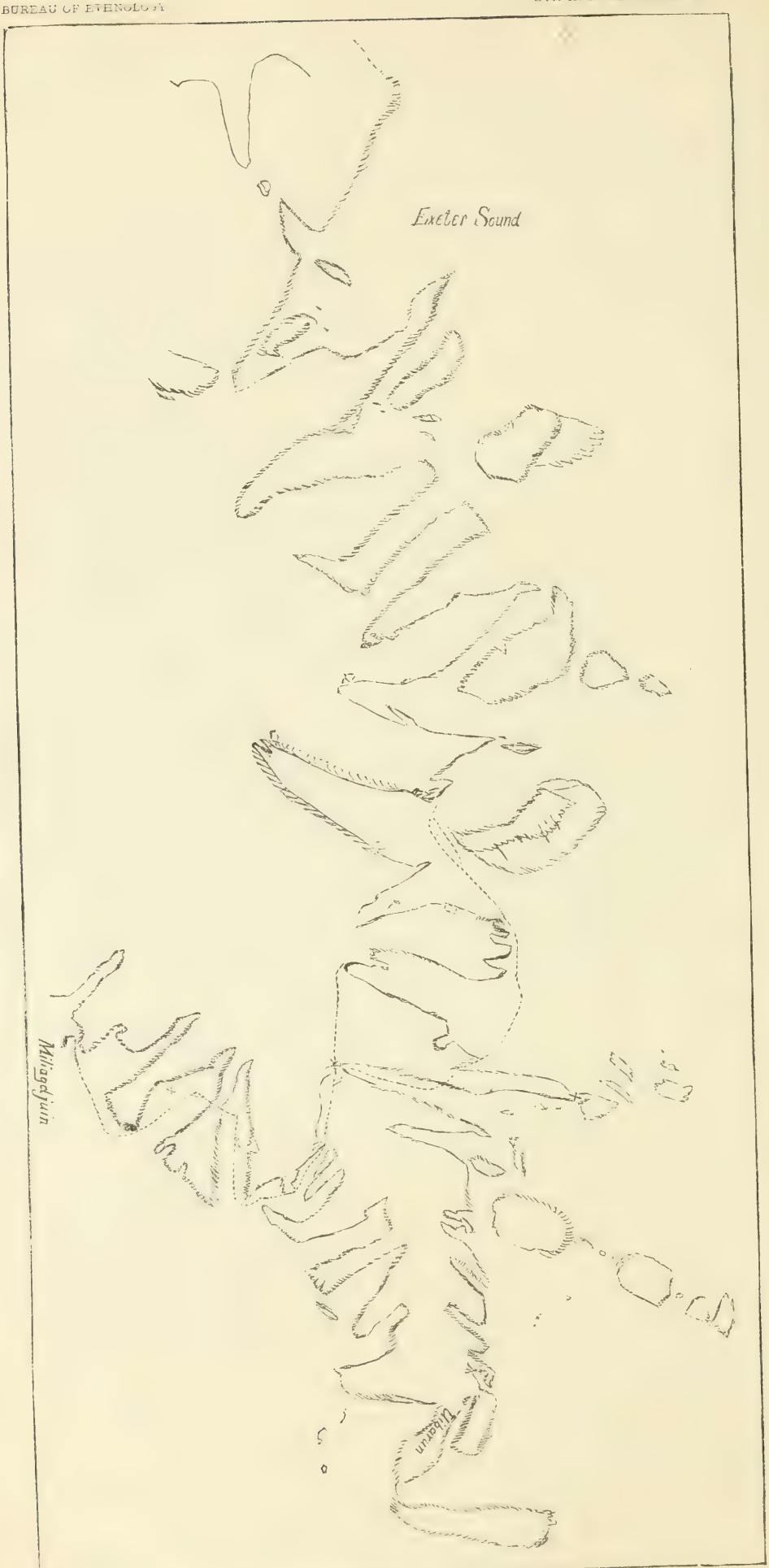
The angakoq's flight to the moon, p. 598.
The Tornit, p. 634.
Origin of the Adlet and the white men, p. 637.

Some of these stories are almost identical in both countries, for instance, Qaudjaqdjuq, the origin of the narwhal, &c., and it is of great interest to learn that some passages, particularly speeches and songs, occur literally in both countries, for instance, the interesting song of Niviarsiang (page 637) and the conclusion of the Kiviung tradition. The tradition of the Tornit and the form of the second tale (origin of the narwhal) resemble much more those of Labrador than those of Greenland. The elements of which the traditions are composed are combined differently in the tales of Baffin Land and Greenland, but most of these elements are identical. I give here a comparative table.

	Greenland.	Baffin Land.
Transformation of a man into a seal.	Rink, pp. 222, 224, 469.	Kiviung, p. 621.
Men walking on the surface of the water.	Rink, pp. 123, 407.	Kiviung, p. 622.
Harpooning a witch.	Rink, p. 372.	Sedna, p. 604.
Erqigdlit.	Rink, pp. 401 et seq.	Adlet, p. 637.
Sledge of the man of the moon drawn by one dog.	Rink, pp. 441, 442.	Qaudjaqdjuq, p. 631, and The flight to the moon, p. 598.
Origin of the salmon.	Cranz, p. 262.	Itit aujang, p. 617.
Arnaquagsaq.	Rink, pp. 150, 326, 466.	Sedna, p. 583.
Origin of the thunder.	Cranz, p. 233; Egede, p. 207.	Kadlu, p. 600.

The following is a comparison between traditions from Alaska and the Mackenzie and those of the Central Eskimo:

Traditions from Alaska and the Mackenzie:	Traditions of the Central Eskimo:
Men as descendants of a dog, Murdoch, op. cit., p. 594.	Origin of the Adlet and white men, p. 637.
The origin of reindeer, Murdoch, op. cit., p. 595.	Origin of the reindeer and walrus, p. 587.
The origin of the fishes, Murdoch, op. cit., p. 595.	Itit aujang, p. 617.
Thunder and lightning, Murdoch, op. cit., p. 595.	Kadlu the thunderer, p. 600.
Sun and moon, Petitot, op. cit., p. 7.	Sun and moon, p. 597.
Orion, Simpson, p. 940.	Orion, p. 636.


Exeter Sound
Milaggiuin
Tiboun

The table shows that the following ideas are known to all tribes from Alaska to Greenland: The sun myth, representing the sun as the brother of the moon; the legend of the descent of man from a dog; the origin of thunder by rubbing a deerskin; the origin of fish from chips of wood; and the story of the origin of deer.

It must be regretted that very few traditions have as yet been collected in Alaska, as the study of such material would best enable us to decide upon the question of the origin of the Eskimo.

SCIENCE AND THE ARTS.

GEOGRAPHY AND NAVIGATION.

The Eskimo exhibit a thorough knowledge of the geography of their country. I have already treated of their migrations and mentioned that the area they travel over is of considerable extent. They have a very clear conception of all the countries they have seen or heard of, knowing the distances by day's journeys, or, as they say, by sleeps, and the directions by the cardinal points. So far as I know, all these tribes call true south piningnang, while the other points are called according to the weather prevailing while the wind blows from the different quarters. In Cumberland Sound uangnang is west-northwest; qaningnang (that is, snow wind), east-northeast; nigirn, southeast; and aqsardnirn, the fohn-like wind blowing from the fjords of the east coast. On Nettilling these names are the same, the east-northeast only being called qanara (that is, is it snow?) In Akudnirn uangnang is west-southwest; ikirtsuq (i. e., the wind of the open sea), east-northeast; oqurtsuq (i. e., the wind of the land Oqo or of the lee side , southeast; and avangnanirn (i. e., from the north side along the shore), the northwestern gales. According to Parry the same names as in Cumberland Sound are used in Iglulik.

If the weather is clear the Eskimo use the positions of the sun, of the dawn, or of the moon and stars for steering, and find their way pretty well, as they know the direction of their point of destination exactly. If the weather is thick they steer by the wind, or, if it is calm, they do not travel at all. After a gale they feel their way by observing the direction of the snowdrifts.

They distinguish quite a number of constellations, the most important of which are Tuktuqdjung (the deer), our Ursa Major; the Pleiades, Sakietaun; and the belt of Orion, Udleqdjun.

As their knowledge of all the directions is very detailed and they are skillful draftsmen they can draw very good charts. If a man intends to visit a country little known to him, he has a map drawn in the snow by some one well acquainted there and these maps are so good that every point can be recognized. Their way of drawing

is first to mark some points the relative positions of which are well known. They like to stand on a hill and to look around in order to place these correctly. This done, the details are inserted. It is remarkable that their ideas of the relative position and direction of coasts far distant one from another are so very clear. Copies of some charts drawn by Eskimo of Cumberland Sound and Davis Strait are here introduced (Plate IV, p. 643, and Figs. 543–546). A comparison between the maps and these charts will prove their correctness. Fre-

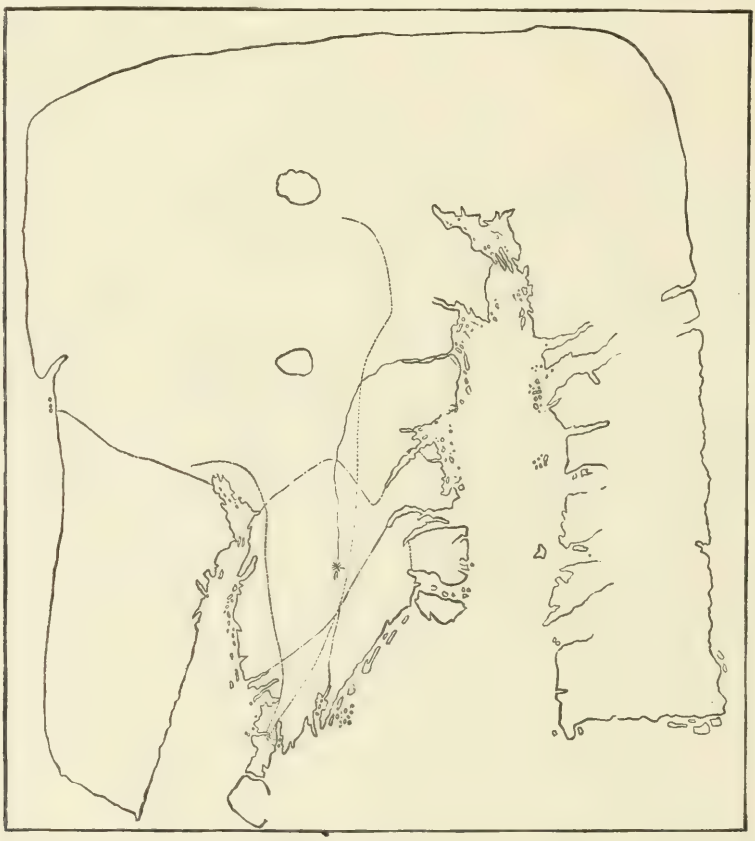


FIG. 543. Cumberland Sound and Frobisher Bay, drawn by Itu, a Nugumio. (Original in the Museum für Völkerkunde, Berlin.)

quently the draftsman makes his own country, with which he is best acquainted, too large; if some principal points are marked first, he will avoid this mistake. The distance between the extreme points represented in the first chart (Fig. 543) is about five hundred miles.

The Eskimo have a sort of calendar. They divide the year into thirteen months, the names of which vary a great deal, according to the tribes and according to the latitude of the place. The surplus is

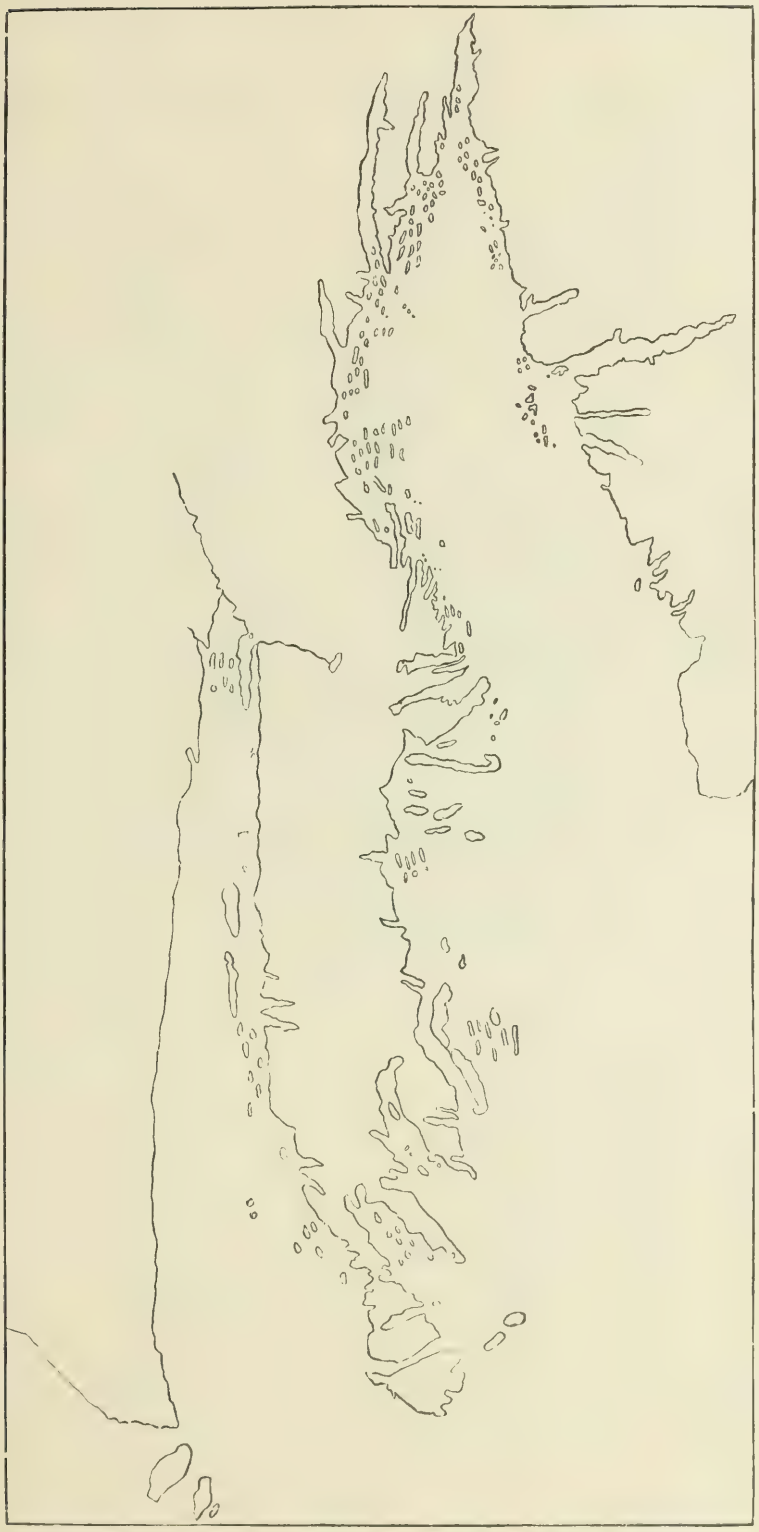


Fig. 544. Cumberland Sound and Frobisher Bay, drawn by Sunapugnang, an Oqomio.

FIG. 545. Cumberland Sound, drawn by Itu, a Nugumio.

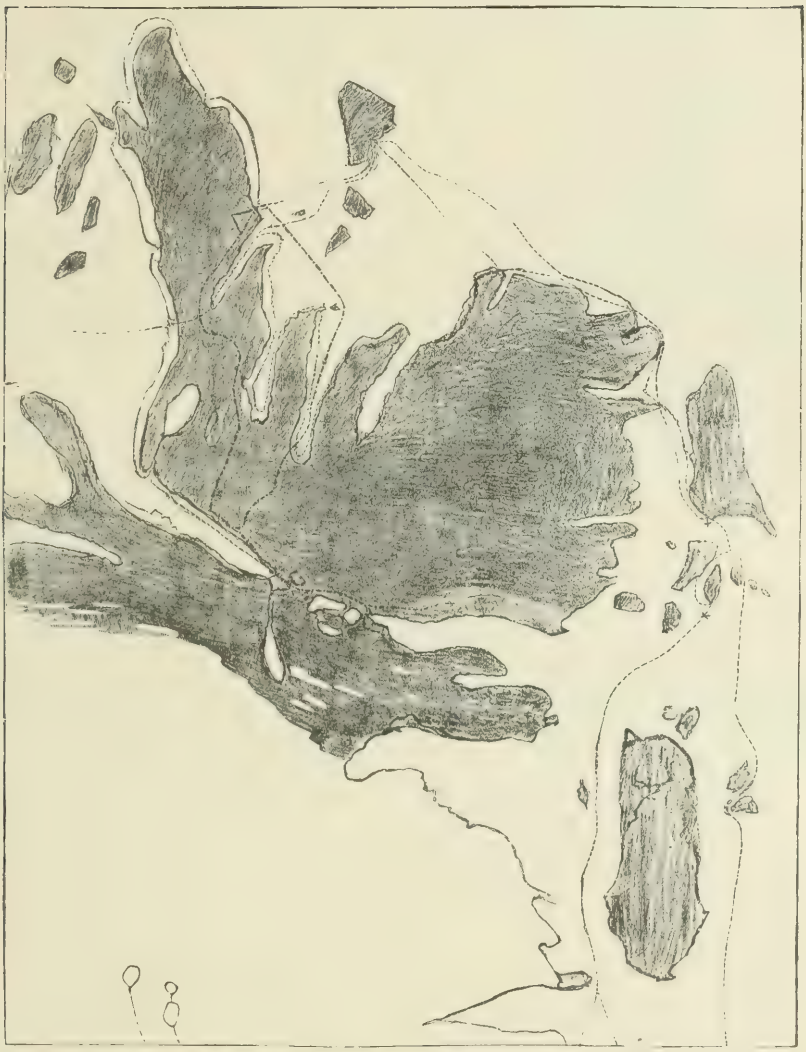


FIG. 546. Peninsula of Qivitung, drawn by Angutuqdjuaq, a Padlimio.

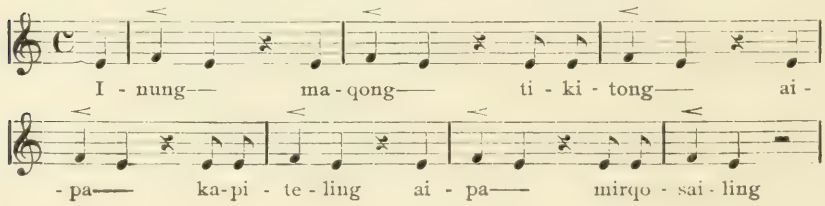
balanced by leaving out a month every few years, to wit, the month siringilang (without sun), which is of indefinite duration, the name covering the whole time of the year when the sun does not rise and there is scarcely any dawn. Thus every few years this month is totally omitted, when the new moon and the winter solstice coincide. The name qaumartenga is applied only to the days without sun but with dawn, while the rest of the same moon is called siriniktenga. The days of the month are very exactly designated by the age of the moon. Years are not reckoned for a longer space than two, backward and forward.

The Eskimo are excellent draftsmen and carvers. Most of the drawings are similar to the bear and deer shown on Plate V (Figs. *d* and *g*) or to the illustrations of the Qaudjaqdjuq tale (see Figs. 537–541, pp. 631–633.) The rest, on Plates VI and VII, are excellently made, and by far superior to any I have seen made by other Eskimo of these regions. A number of carvings are represented on Plates VIII and IX. The narwhal and the whale are particularly admirable. Among the implements represented in this paper there are many of beautiful and artistic design.

I also add a number of engravings of implements plainly showing the influence of European patterns (Plate X).

POETRY AND MUSIC.

Among the arts of the Eskimo poetry and music are by far the most prominent. The tales which have been related are only a small part of their stock of traditions. Besides the contents their form also is very interesting, as most of them have been handed down in unchanged form and their narration demands a great deal of art. Many traditions are told in a very abridged form, the substance being supposed to be known. A specimen of this kind is the Sedna tradition (p. 604). All these tales must be considered recitatives, many of them beginning with a musical phrase and continuing as a rhythmic recitation, others being recited in rhythmic phrases throughout. Other traditions are told in a more detailed and prosaic manner, songs or recitations, however, being sometimes included. Itita-ujang, for instance, in traveling into the country looking for his wife, sings the song No. XIII, and in the Kalopaling tradition the boy, on seeing the two Inuit coming, sings:



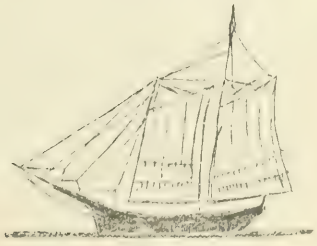
a

b

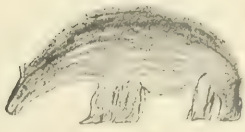
c

d

e



f



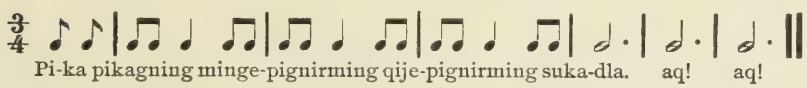
g

a, *b*, *c*, *e* Drawn by Asse'aine, a native of Nuvuljen.

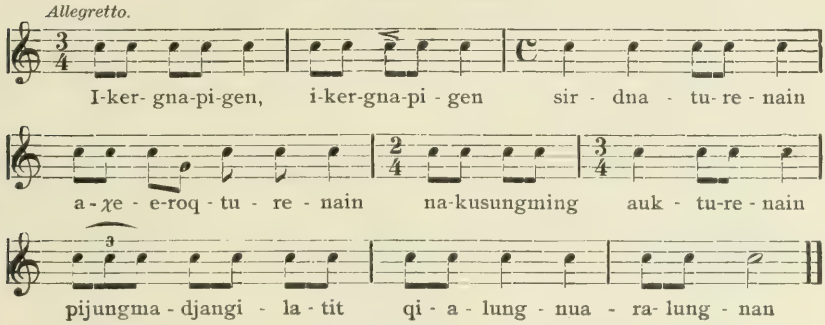
d, *f*, *g* Drawn by Malee, a native of Imigen.

Some Eskimo are very good narrators and understand how to express the feelings of the different persons by modulations of the voice. In addition, as a number of tales are really onomatopoetic, an artistic effect is produced. The way of reciting is always similar to the one above described by notes (p. 648).

Besides these tales, which may be called poetic prose, there are real poems of a very marked rhythm, which are not sung but recited. The following are examples:

MERRYMAKING AMONG THE TORNIT.

The Eskimo reciting this song jump up and down and to the right and left with their legs bent and their hands hanging down, the palms touching each other. In crying aq! aq! they jump as high as possible.

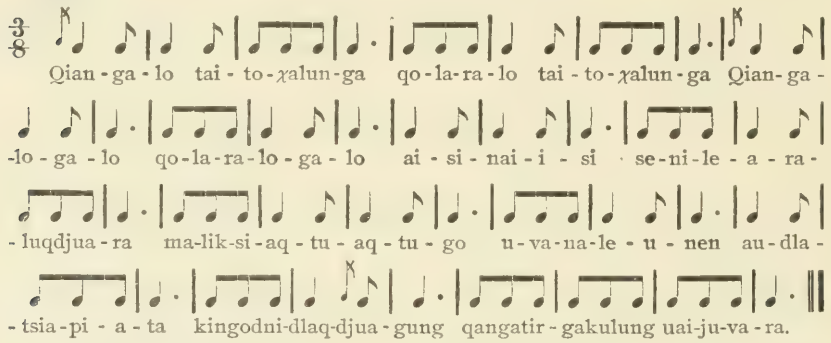
THE LEMMING'S SONG.


Allegretto.
I-ker- gna-pi-gen, i-ker-gna-pi - gen sir - dna - tu- re - nain
a - χe - e-roq - tu - re - nain na-kusungming auk - tu-re - nain
pijungma - djangi - la - tit qi - a - lung - nua - ra- lung - nan

Besides these old songs and tales there are a great number of new ones, and, indeed, almost every man has his own tune and his own song. A few of these become great favorites among the Eskimo and are sung like our popular songs. The summer song (No. I) and "The returning hunter" (No. II) may be most frequently heard. As to the contents of the songs, they treat of almost everything imaginable: of the beauty of summer; of thoughts and feelings of the composer on any occasion, for instance, when watching a seal, when angry with somebody, &c.; or they tell of an important event, as of a long journey. Satiric songs are great favorites.

The form of both old and new songs is very strict, they being divided into verses of different length, alternating regularly. I give here some examples:

ARLUM PISSINGA (the killer's song).

Moderato.

Qian-ga-lo tai-to-χalun-ga qo-la-ra-lo tai-to-χalun-ga Qian-ga-
-lo-ga-lo qo-la-ra-lo-ga-lo ai-si-nai-i-si se-ni-le-a-ra-
-luqdjua-ra ma-lik-si-aq-tu-aq-tu-go u-va-na-le-u-nen au-dla-
-tsia-pi-a-ta kingodni-dlaq-djua-gung qangatir-gakulung uai-ju-va-ra.

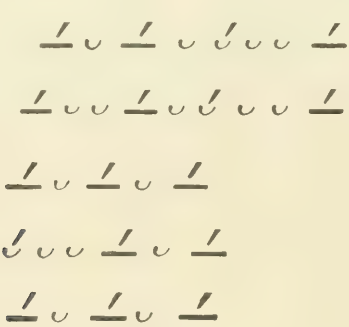
I. The killer's song:
(1) Qiangalo taitoχalunga,
Qolaralo taitoχalunga
Qiangalogalo
Qolarologalo
Aisinaisi.[1]
(2) Senilearaluqdjuara
Maiksiaqtuaqtugo.
Uvanaleunen
Audlatsiapiata
Kingodnidlaqdjuagung
(3) Qangatirgakulunguaijuvara.

II. Summer song:
Aja.
(1) Ajaja adlenaipa.
Adlenaitariva silekdjua una aujaratarame
Ajaja, Ajaja!
Aja!

II. Summer song—Continued.
(2) Ajaja adlenaipa
Adlenaitariva silekdjua una tektorotikelektlune.
Ajaja, Ajaja.
Aja!
(3) Ajaja nipituovokpan!
Nipituovokpan kouvodlalimakoa nunatine aujadle
Ajaja, Ajaja
Aja!
&c.

III. Utitiaq's song:
Aja!
(1) Adlenaipunganema adlenait.
Adlenaipunganema
Adlenaipunganema adlenait,
Aja!

[1] The stanza is scanned thus:



a *b* *c* *d*

Drawn by Aisĕ'ang, a native of Nuvujen.

Drawn by Aiseʻang, a native of Nuvujen

ESKIM

III. Utitiaq's song—Continued.
(2) Sikuqdjualimena adlenait.
Atoqpoqtaromena
Tanerangitu adlenait.
Aja!
&c.

IV. Kadlu's song:
(1) Odlaqē′, odlaqē′, odlaqē′.
Odlaqē′ saranga tutaranga atujang una ajajaja.
Odlaqē′ atedlirlungai aχigirn qodlusuaning aχiatungitunga ajaja.
Nettiulunga iχatijetingirn pinassousirdlunirn pinasuatautlirpadlirunirn.

IV. Kadlu's song—Continued.
(2) Odlaqē′, odlaqē′, odlaqē′.
Odlaqē′ saranga tutaranga atujang una ajajaja.
Odlaqē′ atedlirlungai aχigirn qodlusuaning aχiatungitunga ajaja.
Ugjurutlarunirn iχatijitingirn pinassousirdlunirn pinasuatautlirpadlirnunirn.
(3) . . . . &c.

Some of these verses contain only a single word, the rhythm being brought about by the chorus aja, amna aja, &c. I add two examples of this kind:

V. Song in the language of the Angakut:
Ajarpaija taitlaniqdjuaq ajarpe aitarpik ajijaija.
Ajarpaija ataqdjuaq ajarpe aitarpik ajijaija.
Ajarpaija mingeriaqdjuaq ajarpe aitarpik ajijaija.

VI. Oχaitoq's song:
Aja.
(1) Tavunga tavunga tavunga tavunga
Tavunga tavunga tavunga tavunga tavungadlo tavunga
Aja.
(2) Pissutaramaima tavunga tavunga.
Pissutaramaima tavunga tavunga tavungadlo tavunga, &c.

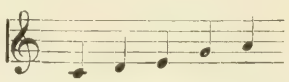
The rhythm of the songs will best be understood by examining the melodies. Every long syllable may be replaced by two or even three short ones; other short syllables appear as unaccented parts before the accented part of a measure; in short, the rhythmic adaptation of the words to the melody is very arbitrary and interchanges frequently occur, so that it is impossible to speak of metric feet. At the same time this furnishes distinct proof that the musical rhythm is the decisive element in determining the form. The rhythmic arrangement of the words is regulated with considerable exactness by the quantity of the syllables, and not by the accent. While, for instance, in speaking, it would be "palirtu′gun," in song No. IV it is "palir′tugun′," and in No. I "tekto′roti′kelek′tlune," instead of "tektorotikelektlu′ne," &c. Such displacements of the accent, however, are avoided if possible, and in the best and most popular songs they hardly appear at all.

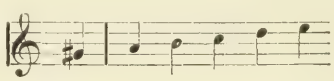
The construction of the songs corresponds entirely with that of the music, inasmuch as every melody and every rhythmically spoken song is made up of musical, that is, rhythmic, phrases which are divided by cæsuræ. Repetitions of the same phrases are very frequent.

The adaptation of the melodies to our divisions of time and measure is also somewhat arbitrary, as they frequently consist of a mixture of three and four part phrases. It is for this reason that I have noted down some songs without any division into bars or measures and in those cases have only marked the accented syllables.

Among the twenty melodies and rhythmic poems we find ten of binary measures, five of triple measures, and six of mixed ones. Of the whole number, nine begin on the full bar, eleven on the arsis.

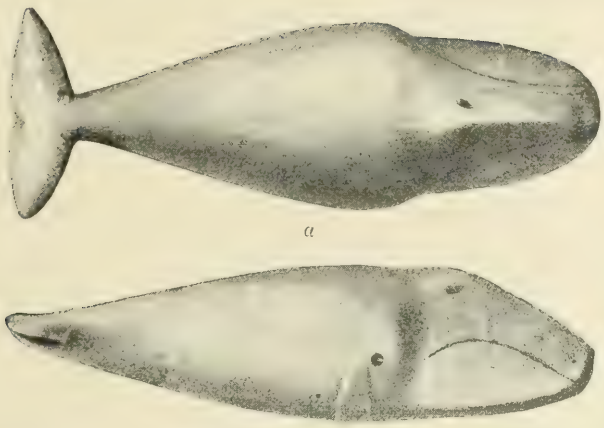
The melodies move within the following range: In a fifth (No. III), one; in a minor sixth (Nos. VII, IX, X), three; in a major sixth (Nos. II, IV, XVII), three; in a seventh (Nos. XII, XIV), two; in an octave, (Nos. I, II, V, VIII, XI, XVI), six; in a minor ninth (No. VI), one; in a major ninth No. (XV), one; in a tenth (No. XIII), one.

These may be divided into two very characteristic and distinct groups. The first, which would coincide with our major key, contains the following essential tones:

The fourth and the sixth occur seldom, and then only as subordinate tones. This key is identical with the Chinese and many of the Indian ones.

In the second group, which corresponds to our minor key, we frequently find the fourth, while the sixth only appears twice and then as a subordinate tone (in No. XV). We furthermore find the major seventh in the lower position leading back to the beginning, i. e., the key note. The essential components of this key are:

Professor R. Succó calls attention to the fact that the relation of the melodies to their key note resembles that of the Gregorian chants, especially the psalmodic ones among them.

If we, in accordance with our ideas, suppose the melody — No. XIII, for example — to begin in C major, it nevertheless does not conclude in the same key, but in E. We would say that No. XIV is written in A minor; still it ends in E. We find the same in the Gregorian chants. They also resemble the songs of the Eskimo in the retention of the same note during a large number of consecutive syllables.

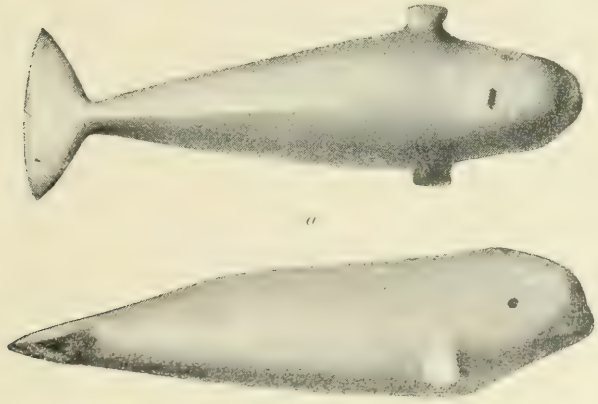
On the whole the melodies, even to our musical sense, can be traced to a key note. However, changes often occur as well (see No. VI). A very striking construction appears in No. XIII, where the oft-repeated E forms a new key note, while at the conclusion the melody leaps back without any modulation to C through the peculiar interval, b, c.



a

b

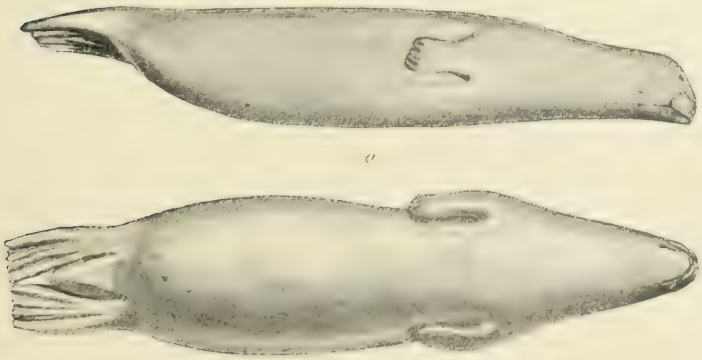
Carving representing whale. (In the possession of Mrs. Adams, Washington.) $\frac{1}{4}$



a

b

Carving representing whale. (National Museum, Washington. 29998.) $\frac{1}{4}$



a

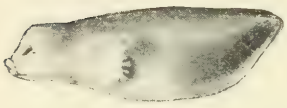
b

Carving representing seal. (National Museum, Washington. 29994.) $\frac{1}{4}$

a

b

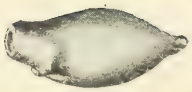
Carving representing narwhal. (In the possession of Capt. John O. Spicer, Groton, Conn.



Seal. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$

Walrus head. (National Museum, Washington. 10414.) $\frac{1}{4}$

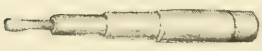
Polar bear. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$



Sealskin float. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$

Seal. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$

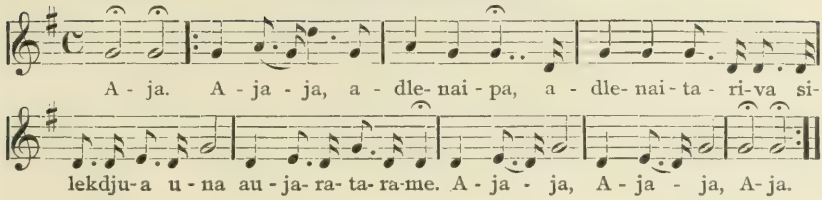
Knife. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$



Spyglass. (Museum für Völkerkunde, Berlin.) $\frac{1}{4}$

I. SUMMER SONG.

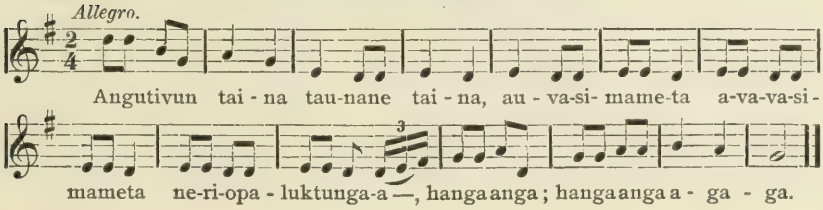
Moderato.

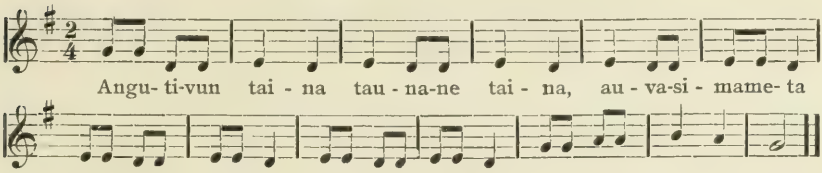


II. THE RETURNING HUNTER.

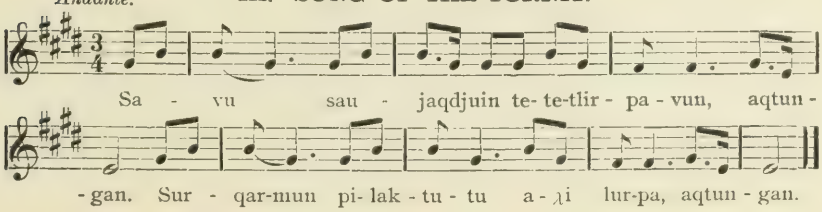
a.

Allegro.



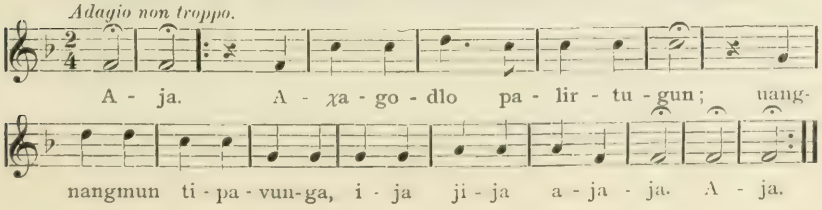
b.

III. SONG OF THE TORNIT.

Andante.

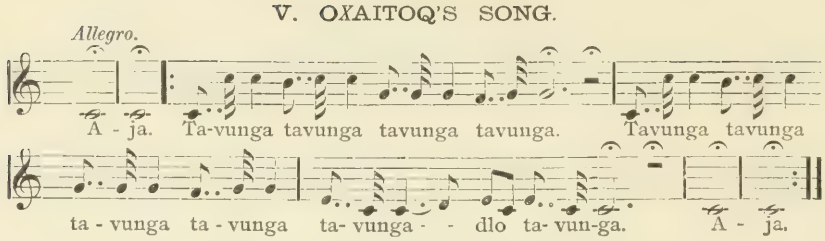


IV. SONG OF THE INUIT TRAVELING TO NETTILLING.

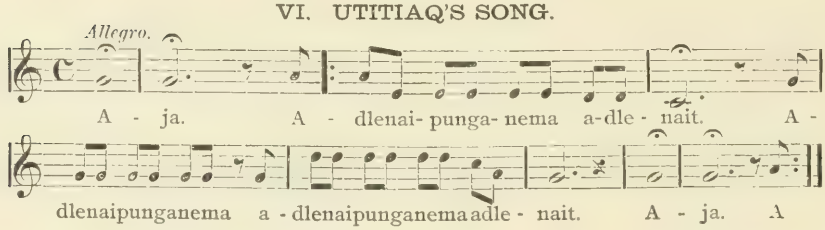
Adagio non troppo.

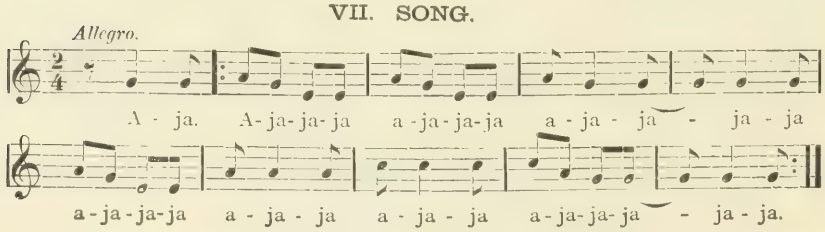


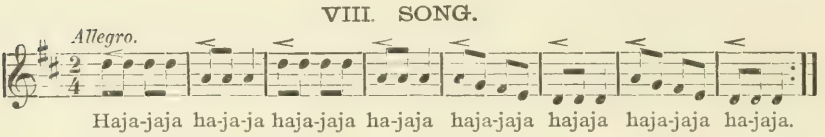
V. OXAITOQ'S SONG.



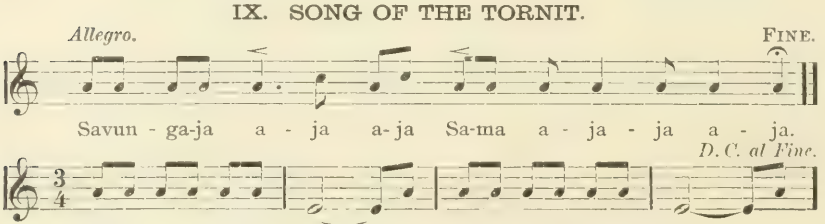
VI. UTITIAQ'S SONG.

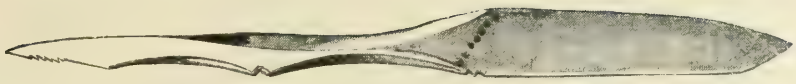


VII. SONG.

VIII. SONG.



IX. SONG OF THE TORNIT.





a

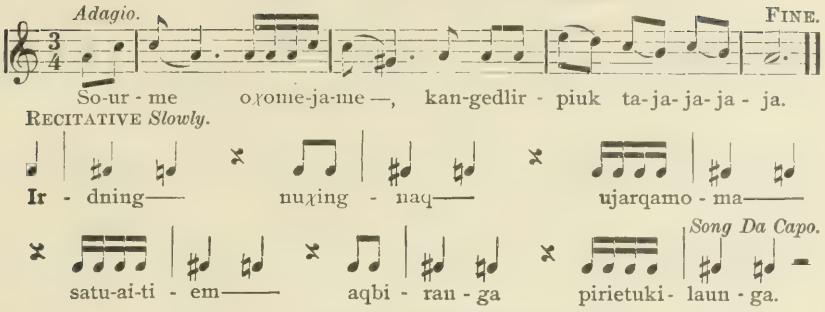
b

c

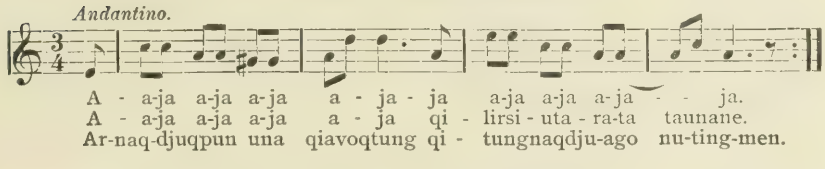
d

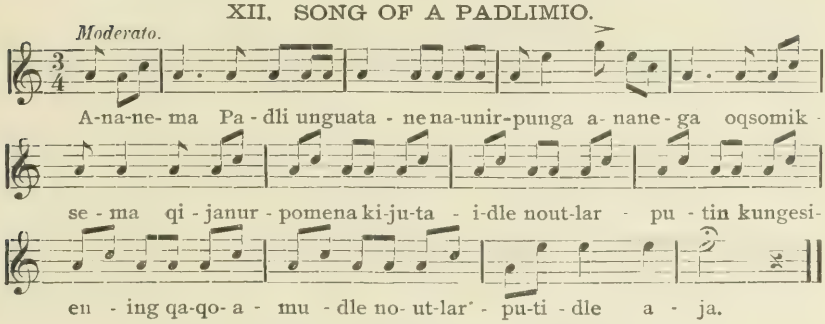
e

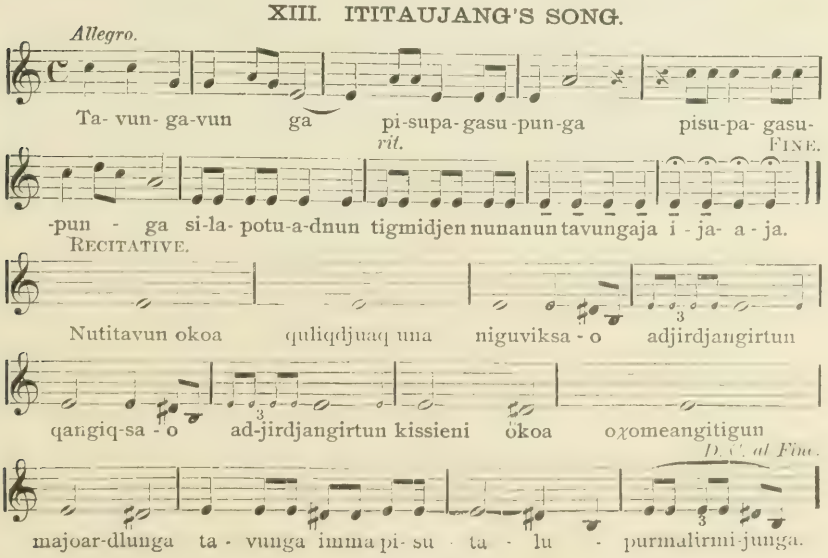
(National Museum, Washington—*a*, 10295; *b*, 68446; *c*, 10296; *e*, 10294.)

X. THE FOX AND THE WOMAN.

Adagio.
FINE.
So-ur - me oχome-ja-me —, kan-gedlir - piuk ta-ja-ja-ja - ja.
RECITATIVE Slowly.
Ir - dning— nuχing - naq— ujarqamo - ma—
Song Da Capo.
satu-ai-ti - em— aqbi - ran - ga pirietuki - laun - ga.

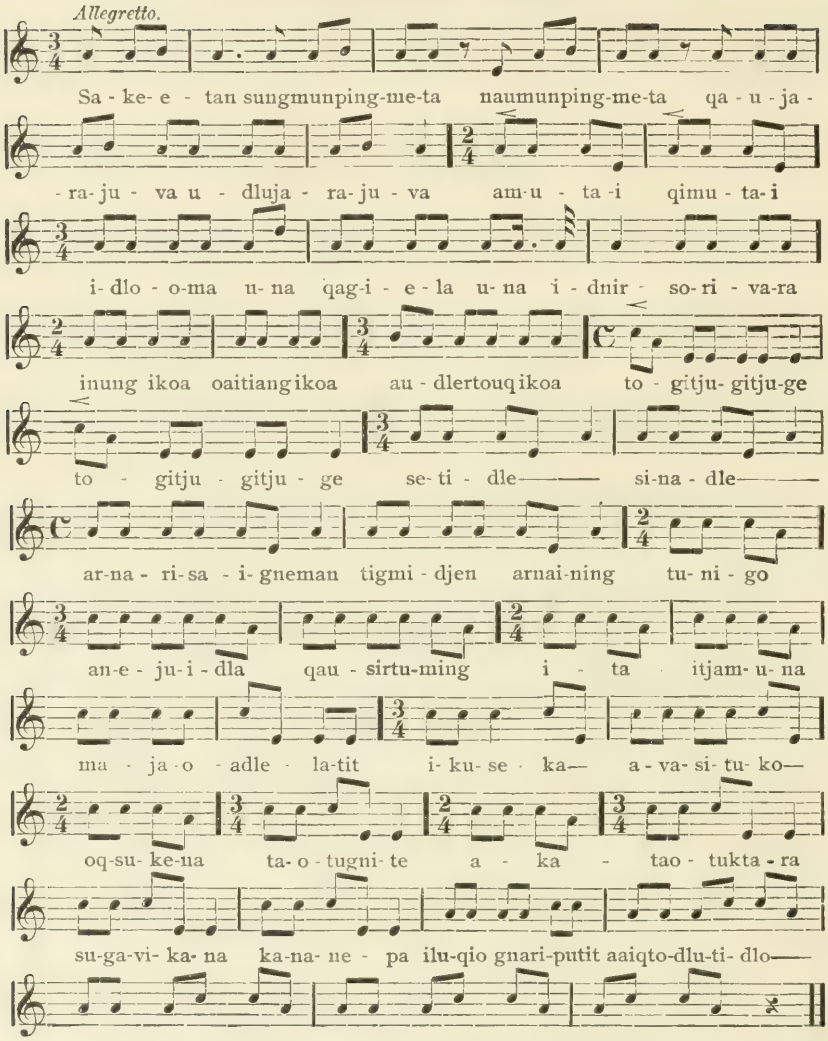
XI. THE RAVEN SINGS.


Andantino.
A - a-ja a-ja a-ja a - ja - ja a-ja a-ja a-ja - - ja.
A - a-ja a-ja a-ja a - ja qi - lirsi - uta - ra-ta taunane.
Ar-naq-djuqpun una qiavoqtung qi - tungnaqdju-ago nu-ting-men.

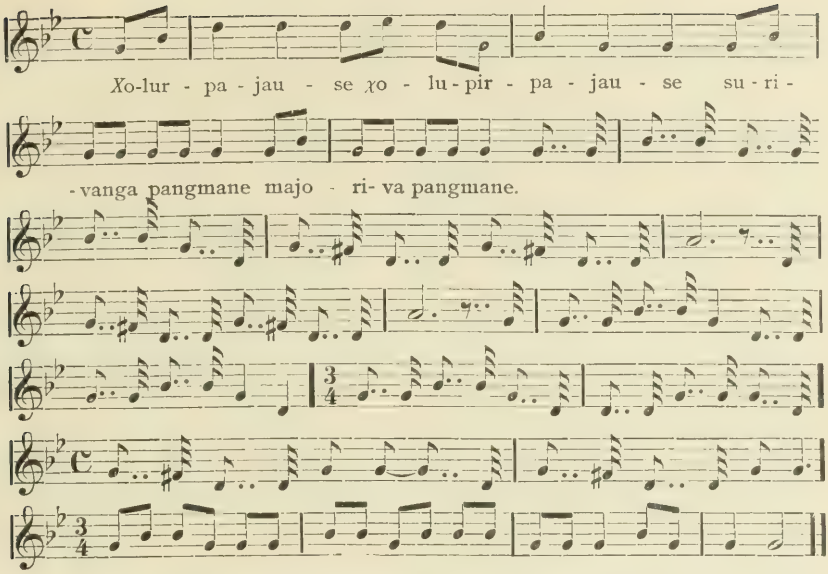
XII. SONG OF A PADLIMIO.

Moderato.
A-na-ne- ma Pa - dli unguata - ne na-unir-punga a- nane - ga oqsomik -
se - ma qi - janur - pomena ki-ju-ta - i-dle nout-lar - pu - tin kungesi-
en - ing qa-qo- a - mu - dle no- ut-lar - pu-ti - dle a - ja.

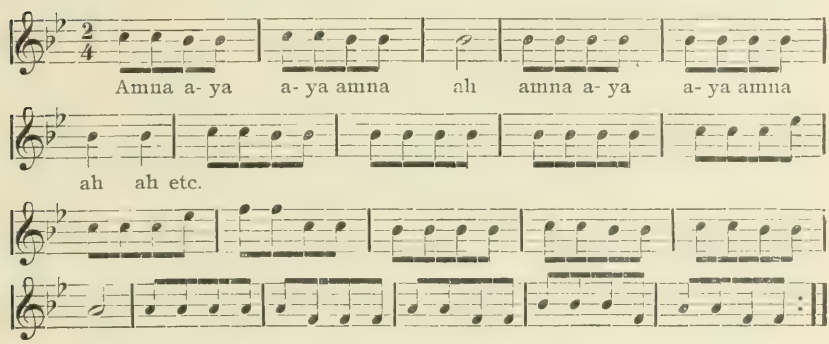
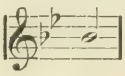
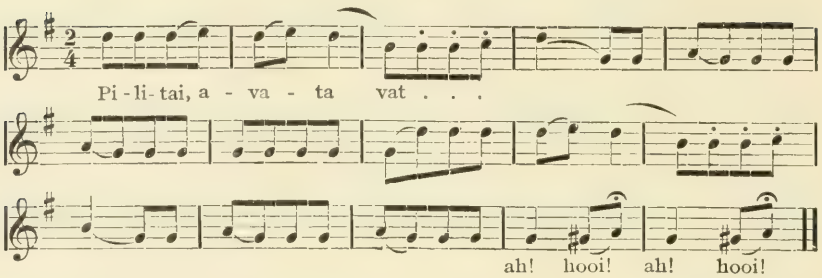
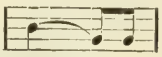
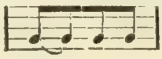
XIII. ITITAUJANG'S SONG.

Allegro.
Ta- vun- ga-vun ga pi-supa-gasu-pun-ga pisu-pa- gasu-
rit.
FINE.
-pun - ga si-la- potu-a-dnun tigmidjen nunanun tavungaja i - ja- a - ja.
RECITATIVE.
Nutitavun okoa quliqdjuaq una niguviksa - o adjirdjangirtun
qangiq-sa - o ad-jirdjangirtun kissieni okoa oχomeangitigun
D. C. al Fine.
majoar-dlunga ta - vunga imma pi- su - ta - lu - purmalirmi-junga.

XIV. PLAYING AT BALL.

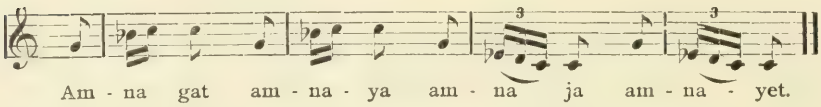

Allegretto.
Sa - ke- e - tan sungmunping-me-ta naumunping-me-ta qa - u - ja -
- ra- ju - va u - dluja - ra- ju - va am-u - ta -i qimu - ta- i
i- dlo - o-ma u- na qag-i - e - la u- na i - dnir - so- ri - va-ra
inung ikoa oaitiangikoa au - dlertouqikoa to - gitju- gitju-ge
to - gitju - gitju - ge se- ti - dle——— si-na - dle———
ar-na - ri-sa - i- gneman tigmi - djen arnai-ning tu- ni - go
an-e - ju-i - dla qau - sirtu-ming i - ta itjam- u- na
ma - ja - o - adle - la-tit i- ku- se - ka— a - va- si- tu- ko—
oq-su- ke-na ta- o - tugni- te a - ka - tao - tukta - ra
su-ga-vi- ka- na ka-na- ne - pa ilu-qio gnari-putit aaiqto-dlu-ti- dlo——
ne-ser - todlu - tidlo a- va - tirtung - giengo - dlu-ti - dlo

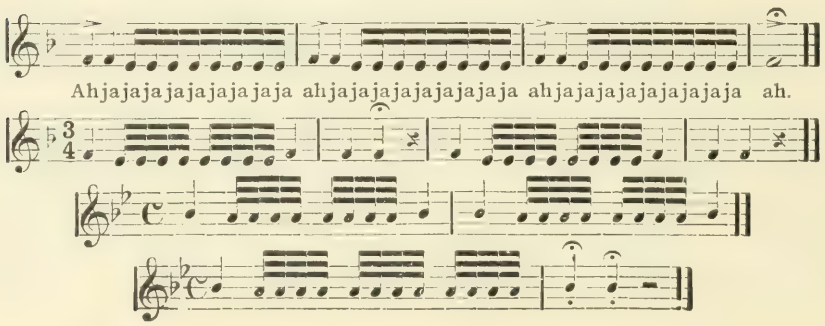
XV. PLAYING AT BALL.



XVI. From Parry, Second Voyage, p. 542, Iglulik.

The sixteenth bar is probably

XVII. From Lyon, Private Journal, p. 135, Iglulik.

According to Parry, p. 542, the fourth bar of XVII is written: ; the eighth, ; Lyon bar after the twelfth bar  inserted.

XVIII. From Kane, Arctic Explorations. The Second Grinnell Expedition, I, p. 383. From Ita, Smith Sound.



XIX. From Bessels's Amerikanische Nordpol-Expedition, p. 372.

GLOSSARY.

ESKIMO WORDS USED, WITH DERIVATIONS AND SIGNIFICATIONS.

A.

ADLIPAR'MIUT, the inhabitants of the country farthest below; from *at*, below; *-lirn*, being in a certain direction; *-pāng*, superlative; *-mio* (plural, *-miut*), inhabitant of.

A'DLIRN, a small lamp on the floor of the hut; from *at*, below; *-lirn*, being in a certain direction.

ADLI'VUN, those beneath us; from *at*, below; *-lirn*, being in a certain direction; *-vun*, possessive first person plural.

A'GDLAG, black bear.

AGDLIAQ, a small spear; from *ake-*, across; *-dlivoq*, he provides with; *-aq*, past participle.

AG'GIRN, a species of duck (*Anas glacialis*).

AISS'IVANG, spider.

A'JANG, beam of kayak; from *ajaq-*, to support.

AJA'RORPOQ, he plays the game cat's cradle.

AJE'GAUNG, a game.

AJOKITARPOQ, a game.

AJUKTAQ'TUNG, batting the ball.

AKPARAIK'TUNG, hook for preventing the loss of harpoon.

AKUD'NANG, paddle handle; from *ako*, middle.

A'KUK, lateral strips of wood used in boat; from *ako*, middle.

A'LIRN, harpoon line.

A'MAROQ, wolf.

A'MING, skin of land animals, cover of boat and kayak.

ANG'AKOQ, a magician, conjurer.

ANGAKUNIRN, the art of the angakoq.

ANG'AKUT, plural of angakoq.

ANGIAQ, spirit of a murdered child (Greenland).

ANG'UN, paddle.

ANGUTA', his father.

ANGU'VIGANG, lance; from *anguvoq*, he goes sealing with the harpoon.

ANING'A, her brother (the moon).

A'NO, dog harness.

A'PUMANG, gunwale.

AQO'JANG, stern of kayak.

AQSAR'DNIRN, wind blowing down a valley.

ARAU'TAQ, snow beater (Aivillik dialect).

ARM'GOAQ, amulet.

ASE'DLUN, flat receptacle for the harpoon line on kayak.

ASIMAU'TANG, piece of board or whalebone on which skins are cleaned.

ATAU'TA, neck of sealskin float; from *atav-*, to be connected.

AUDLITI'VING, vault back of snow house.

AVANGNA'NIRN, northwestern gales along the coast of Baffin Land.

A'VAU'TANG, sealskin float.

AVAUTAPĀQ', large sealskin float; from *avautang*, sealskin float; *-pāq*, superlative.

A'VIGNAQ, lemming.

AχI'GIRN, ptarmigan.

E.

EχALŪ'JANG, carved ivory fish, used as bait; from *eχaluq*, salmon; *-ujang*, similar to.

EχALUQ, salmon.

I.

IDLUK' a fabulous fish.

IGDL'U, snow house.

IGDL'UARN, a vault attached to snow hut; from *igdlu*, snow house; *-arn*, small.

IGDLUKITAQ'TUNG, playing with two balls, tossing them up alternately; from *igdlung*, both; *-kitarpoq*, he uses at the same time.

IGDLU'LING, second vault of snow house; from *igdlu*, snow house; *-ling*, with.

I'GIMANG, ball-and-socket joint of harpoon and lance; from *igipā'*, he throws it off.

IKAN', store room supported by stone pillars; from *ikarpoq*, it stretches from one support to another.

IKIRT SUQ, wind blowing from the open sea.

ILAGA, my friend (Netchillik).

ILUPI'QANG, lining of snow house; from *ilo*, inner.

IMITI'JUNG, drinking water; from *imiq*, fresh water.

INETANG, hoop with net of thongs to dry clothing etc. in snow house: from *inivā'*, he hangs it up.

IN'UA, its man, owner; possessive third person of *inung*, man.

INUG'SUNG, cairn; from *inung*, man.

IPAR'ANG, harpoon line.

IP'UN, oar, a s ear.

IRQATA'TUNG, a certain circuit among the huts.

ISSUMAU'TANG, a chief; from *issu'mavoq*, he thinks.

ITIGEGA, boot (Iglulik).

ITIR'BING, cross piece abaft the hole in kayak; from *itiq*.

K.

KABLIAQDJUQ, wolverine (Iglulik).

KAITIKPOQ, a game.

KAIVITI'JUNG, a game.

KAKI'VANG, fish spear.

KAKLIO'KIA, hook (Iglulik).

KALU'GIANG, a heavy lance (*qalugiang?*).

KAN'GO, a species of goose.

KA'PUN, spear; from *kapivā'*, he stabs him.

KA'TENG, entrance to stone hut.

KENTUN, drumstick.

KIDLU'LIRN, lamp standing in the rear of the hut.

KI'GLO, boat post.

KILAUT, drum.

KOUKPARMIU'TANG, a certain amulet at point of hood.

KU'JANG, keel of kayak.

M.

MA'LING, paddle blade.

MA'MI, membrane or inner side of skin.

MA'SING, cross piece before hole in kayak.

MIR'QUN, needle.

MIRQUSS'ANG, two masked persons.

MUMIPOQ, he dances.

N.

NABI'RING, a loop; from *nā'poq*, he hinders a motion.

NA'PO (plural *napun*), cross bar of sledge.

NAQETA'RUN, lashing for the sledge; from *naqigpoq*, it is pressed down.

NAU'LANG, harpoon head.

NE'TIVANG, *Phoca cristata*.

NI'GIRN, southeast.

NIKSIANG, hook.

NIKSIAR'TAUNG, fish hook.

NIRT'SUN, small ropes used in sledge and house.

NIUQ'TUNG, drill bow with string; from *niorpoq*, he drills.

NIU'TANG, hoop with skin stretched over it; beam of kayak.

NUGLU'TANG, a certain game.

NU'IRN, bird spear.

NULLANITITI'JUNG, exchange of wives.

NUNAJISAR'TUNG, a certain festival.

NUQSANG, throwing board.

NUSSUERAQTUNG, a certain festival.

O.

OQUR'TSUQ (Akudnirn), southeast, blowing from Oqo; from *oqo*, weather side.

P.

PA, hole of kayak.

PAKIJUMIJAR'TUNG, game of hook and crook.

PA'NA, double edged knife.

PARTI'RANG, button for closing the *pitu*; from *pārpa*, he meets him.

PAUK'TUN, pegs.

PAU'TING, double bladed kayak paddle.

PI'LAUT, large knife.

PILEK'TUNG, cutting something.

PI'MAIN, chief, he who knows everything best by practice.

PI'NINGNANG, true south.

PIR'QANG, shoeing of runners of sledge.

PITIQ'SE, bow.

PITKUSI'RARPOQ, a certain game.

PI'TU, a stout thong, consisting of two parts to fasten traces to sledge.

POVIU'TANG, pipe for inflating skins; from *pō-*, to blow.

PUKIQ, the white part of a deerskin.

Q.

QADLUNAIT, Europeans.
QÁG'GI, singing house.
QAILERTE'TANG, a certain masked figure.
QAI'VUN, drill.
QA'JAQ, kayak.
QA'MUN, sledge runner.
QA'MUTING (dual of *qamun*), sledge.
QANA'RA, east-northeast (Nettilling); from *qaning*, falling snow.
QANG'ING, a toggle.
QANG'IRN, a ventilating hole in snow house; from *qa*, above.
QA'NING, a certain rib of kayak.
QA'NINGNANG, east-northeast; from *qaning*, falling snow.
QAQ'DJUNG, arrow.
QA'REANG, annex of house for an additional family.
QAR'MANG (plural *qarmat*), stone or bone house.
QARMAU'JANG, similar to a *qarmang;* suffix, *-ujang*, similar to.
QASI'GIAQ, *Phoca annellata.*
QATILIK, a spear (Iglulik); from *qatirn*, ivory head of harpoon shaft; *-lik*, with.
QA'TIRN, ivory head of harpoon shaft.
QATU'RANG, a boot ornament.
QAUMARTENG'A, days without sun, but with dawn.
QAU'MAT, a kind of fire (?); from *qauq*, daylight.
QAUMATI'VUN, sun (in the sacred language of the angakut).
QAUMA'VUN, moon (in the sacred language of the angakut).
QAUQ, daylight.
QIDJA'RUNG, whirl; from *qipivā'*, he twists it.
QIJUQTENG'A, harpoon shaft; from *qijuq*, wood.
QILAQ, sky.
QILER'TUANG, clasp for holding the coils of the harpoon line; from *qilerpā'*, he ties it with a knot.
QING'ANG, a hole to look out of snow house.
QING'MIAQ, mouth piece of drill.
QIPEKU'TANG, rod to indicate approach of seal to his hole.
QI'PIQ, blanket.
QI'QIRN, phantom in the shape of a huge, hairless dog.
QOQSIUARIVA, the ceremony of washing children with urine.
QUDLIPAR'MIUT, the inhabitants of the country farthest above; from *qu*, above; *-lirn*, being in a certain direction; *-pāng*, superlative; *-mio* (plural, *-miut*), inhabitant of.
QUDLIRN, a lamp; from *qu*, above; *-lirn*, being in a certain direction.
QUDLI'VUN, the uppermost ones; from *qu*, above; *-lirn*, being in a certain direction; *-vun*, possessive first person plural.
QUDLUQSIU'TA, ring on a paddle.
QU'MING, a certain lamp.
QUQAR'TAUN, an implement to string fish.
QUVIE'TUNG, a festival.

S.

SADNI'RIAQ, cross piece, a certain button, from *sadne*, side, across.
SADNI'RUN, a yard.
SĀKETĀN', roulette; from *sakagpā'*, he pushes it.
SAKIE'TAUN, the Pleiades.
SAKURPĀNG', whale harpoon; from *sako*, weapon; *-pāng*, the largest.
SA'VING, knife.
SELIGO'UNG, scraper; from *selivā'*, he cleans a skin.
SIAD'NIRN (plural, *siadnit*), lateral strip in kayak; from *siaq-*, to place in a row; *-nirn*, being.
SIAT'KO, harpoon head (Iglulik).
SIEK'TUNG, the three stars in Orion's belt: those standing in a row.
SIR'DLOANG, store room of snow house.
SIRING'ILANG, the excepted month in balancing Eskimo calendars, the month without sun; from *sirinirn*, sun; *-ngilang*, he has not.
SIRINIKTENG'A, the first days with sunlight; from *sirinirn*, sun; *-tang*, new; *-a*, possessive third person singular.
SIRMI'JAUNG, scraper for kayak; from *sirming*, thin ice.
SULUBAUT', bunch of hair projecting from forehead.
SULUI'TUNG, festival in which a knife (*sulung*) is used.
SU'LUNG, wing; knife shaped like a wing.

T.

TAGUSIAR'BING, eye (of harpoon).
TAGUTA', a thong (of harpoon).

TELIQ'BING, certain piece on harpoon line.
TESIR QUN, scraper: from *tesivā'*, he stretches it.
TIGDLUIQ'DJUNG, blow with the fist (of a stranger); from *tigdlugpā'*, he strikes him with the fist.
TIKA'GUNG, support of hand in throwing harpoon.
TI'KIQ, thimble.
TIK'PING, rib of kayak.
TILUQ'TUNG, snow beater; from *tiluqpā'*, he strikes it, in order to shake something off.
TINGMI'UJANG, images of birds (used for dice); from *tingmiang*, bird; *-ujang*, similar to.
TO'KANG, harpoon head.
TOQ'SUNG, vaulted entrance to snow house.
TOR'NAQ, a guardian spirit.
TORNARSUQ, the great *tornaq*.
TO'UNG, tusk, point.
TOUNG'A, point of spear.
TUGLIGA, a tress.
TUKTUQ'DJUNG, the constellation of the Reindeer, or the Great Bear, Ursa Major; from *tukto*, caribou (deer).
TUMI'UJANG, a certain lamp resembling a footprint; from *tume*, footprint; *-ujang*, similar to.
TUNIQ'DJUNG, stern of kayak.
TU'PILAQ, spirit of a deceased person.
TU'PIQ, tent.
TUPU'TANG, plugs for closing wounds.
TUTA'REANG, a certain buckle.
TU'VING, strip in the boat nearest the gunwale; from *tuk-*, to stop a motion; *tupā'*, he makes it fast.

U.

UA'DLING, first vault of snow house.
UANG'NANG, west-northwest, Cumberland Sound; west-southwest in Akudnirn.
UDLEQ'DJUNG, Sword of Orion: following one another.
UI'NIRN, head of sledge runner.
U'KUSIK, soapstone kettle.
U'LO, woman's knife.
ULUQ'SAQ, green slate, material for women's knives; from *ulo* and *-saq*, material for.
U'MIAQ, large skin boat.
UMING, beard.
U'MINGMANG, musk ox.
UMI'UJANG, needle case.
U'NANG, sealing harpoon.
UNAQIU'TA, ring on shaft of sealing harpoon; from *unang; -iarpā'*, he fastens it; *-ta*, past participle.
UNARTENG'A, iron rod of sealing harpoon; from *unang; -tang*, belonging to; *-a*, possessive.
UQSIRN, implement for fastening traces to sledge.
USUJANG, stern projection of kayak; from *usung*, penis; *-ujang*, similar to.

ESKIMO GEOGRAPHICAL NAMES USED, WITH ENGLISH SIGNIFICATIONS.

A.

AGDLINARTUNG.
AGGIRTIJUNG, abounding with ducks.
AGGO, the weather side.
AGGOMIUT, the inhabitants of Aggo.
AGPAN, loons.
AGUTIT.
AIVILLIK, with walrus.
AIVILLIRMIUT, the inhabitants of Aivillik (the walrus country).
AKUDNIRMIUT, the inhabitants of Akudnirn.
AKUDNIRN, the intervening country.
AKUGDLIRN, the central one.
AKUGDLIT, the central ones.
AKULIAχATING.
AKULIAQ.
AKULIARMIUT, the inhabitants of Akuliaq.
AMAQDJUAQ, the large place where children are carried in the hood.
AMARTUNG, a woman carrying a child in the hood.
AMITOQ, the narrow one.
ANARNITUNG, smelling of excrements.
ANARTUAJUIN, the excrements.
ANAULEREË'LING.
ANGIUQAQ; from *angivoq*, it is large.
ANGMALORTUQ, the round one.
ANGMANG, jasper.
ANGMARTUNG, the open one (not frozen over).
AQBENILING, six; so called because reached after six days' travel.

AQBIRSIARBING, a lookout for whales.
AQBIRTIJUNG, abounding with whales.
AQOJANG; from *aqo*, stern.
AQOJARTUNG; from *aqo*, stern.
ARLIGAULIK.
AUDNERBING, place where seals are approached by the crawling hunter.
AUGPALUGTIJUNG, with many red places.
AUGPALUGTUNG, the red one.
AULITIVING, an annex of the snow house; hills lying at the foot of steep cliffs.
AUQARDNELING, with many places where the ice melts early in spring.
AVATUTIAQ.
AVAUDJELING, with a low saddle.

E.

EχALOAPING, with common salmon.
EχALUALUIN, the large salmon (plur.).
EχALUAQDJUIN, the small salmon (plur.).
EχALUIN, the salmon (plur.).
EχALUQDJUAQ, the shark.
EχOLEAQDJUIN.

I.

IDJORITUAQTUIN, the only places with an abundance of grass.
IDJUK, the testicles.
IGDLUMIUT, the inhabitants of the other side.
IGDLUNGAJUNG, the bandy legged man; so called from a fabulous tribe.
IGDLUQDJUAQ, the large house.
IGLULIK, with houses.
IGLULIRMIUT, the inhabitants of the place with houses.
IGPIRTO, with many hills.
IGPIRTOUSIRN, the smaller place with many hills.
IJELIRTUNG.
IKAROLING, with a ford.
IKERASSAQ, the narrow strait.
IKERASSAQDJUAQ, the large narrow strait.
ILIQIMISARBING, where one shakes one's head.
IMERAQDJUAQ.
IMIGEN, with fresh water.
INGNIRN, flint.
INUGSUIN, the cairns.
INUGSULIK, with cairns.
IPIUTELING, with an isthmus.
IPIUTING, the isthmus; literally, the traces of a dog.
IRTIUJANG.
ISIRITUNG.
ISOA, its cover.
ISSORTUQDJUAQ, the large one with muddy water.
ITA, food.
ITIDLIAPING, the common pass.
ITIDLIRN, the pass.
ITIJARELING, with a small pass.
ITIRBILUNG, the anus.
ITIVIMIUT, the inhabitants of the coast beyond the land.
ITUATUKAN.
ITUTONIK (Etotoniq).

K.

KAMING'UJANG, similar to a boot.
KANGERTLOA'PING, the common bay.
KANGERTLUA'LUNG, the large bay.
KANGERTLUKDJUAQ, the large bay.
KANGERTLUK'SIAQ.
KANGERTLUNG, the bay.
KANGIA, its head, its upper part (of a bay).
KANGIANGA, its upper part.
KANGIDLIUTA, nearest to the land.
KANGIVAMIUT, inhabitants of Kangia.
KAUTAQ, diorite.
KILAUTING, the drum.
KINGNAIT, the high land.
KINGNAITMIUT, the inhabitants of Kingnait.
KINIPETU.
KITIGTUNG, the island lying farthest out toward the sea.
KITINGUJANG, the gorge.
KOUAQDJUAQ.
KOUKDJUAQ the large river.
KOUKSOARMIUT, the inhabitants of Kouksoaq.
KOUKTELING, with a river.
KUGNUAQ, the small nice river.

M.

MAJORARIDJEN, the places where one has to climb up.
MAKTARTUDJENNAQ, where one eats whale's hide.
MALUKSILAQ.
MANIRIGTUNG, with many eggs.

MANITULING, with uneven places.
METJA, the lid.
MIDLURIELING, where stones are thrown (for catching white whales).
MILIAQDJUIN, the small ones, which shut it up (?).
MILIQDJUAQ, the large one, which shuts up (?).
MINGONG, the beetle.
MISIQTUNG.
MUINGMANG.

N.

NANUQTUAQDJUNG, the little bear.
NANURAGASSAIN, abounding in young bears.
NAQOREANG.
NARPAING.
NAUJAN, the gulls.
NAUJAQDJUAQ, the large gull.
NAUJATELING, with gulls.
NEBARVIK.
NEDLUNG, peninsula from the point of which deer are driven into the water; from *nedlugpoq*, he swims.
NEDLUQSEAQ; from *nedlugpoq*, he swims.
NEQEMIARBING, where something is carried in the hand.
NERSEQDJUAQ, the large valley.
NETCHILLIK, with seals.
NETCHILLIRMIUT, the inhabitants of Netchillik (the seal country).
NETTILLING, with seals.
NIAQONAUJANG, similar to a head.
NIKOSIVING; from *nikuipoq*, it stands erect.
NIRDLIRN, the goose.
NIUTANG, hoop used in whaling.
NUDLUNG, the posteriors.
NUDNIRN, the point.
NUGUMIUT, the inhabitants of the point.
NURATA.
NURATAMIUT, the inhabitants of Nurata.
NUVUJALUNG, the large cape or point.
NUVUJEN, the points.
NUVUKDJUAQ, the great point.
NUVUKDJUARAQDJUNG, the little Nuvukdjuaq.
NUVUKTIRPĀNG', the greatest point.
NUVUKTUALUNG, the only great point.
NUVUNG, the point.

O.

OKAN, the codfish (plural).
OKAVIT.
OPERDNIVING, place where one lives in spring.
OQO, the weather side.
OQOMIUT, the inhabitants of Oqo.
OWUTTA.

P.

PADLI, with the mouth of a river.
PADLIAQ, the little mouth of the river. (?)
PADLIMIUT, the inhabitants of Padli.
PADLOPING; from *padlorpoq* (lying on the face?).
PAMIUJANG, similar to a tail.
PANGNIRTUNG, with many bucks.
PIKIULAQ, *Uria grylle*.
PILING, with many things (i. e., game).
PILINGMIUT, the inhabitants of Piling.
PINGITKALIK.
PITIKTAUJANG.
PUJETUNG, with plenty of blubber.
PUTUKIN.

Q.

QAGGILORTUNG; from *qaggi*, singing house.
QAIROLIKTUNG, with plenty of seals (*Phoca grœnlandica*).
QAMUSIOJODLANG.
QARIAQ.
QARMANG, walls.
QARMAQDJUIN, the large walls
QARUSSUIT, the caves.
QASIGIDJEN, *Callocephali*.
QAUMAUANG; from *qauq*, daylight.
QAUMAUANGMIUT, the inhabitants of Qaumauang.
QAχODLUALUNG, the large fulmar.
QAχODLUIN, the fulmars.
QEQERTAKADLINANG; from *qeqertaq*, island.
QEQERTALUKDJUAQ, the large island.
QEQERTAQ, the island.
QEQERTAUJANG, similar to an island.
QEQERTELUNG, the large island.
QEQERTEN, the islands.
QEQERTOME ITOQ TUDLIRN, next to the island.
QEQERTUQDJUAQ, the large island.
QERNIQDJUAQ, the great black place.

QIDNELIK.
QIMISSUNG, the snow drift.
QIMUQSUQ; from *qimuqpoq*, he draws the sledge.
QINGASEAREANG.
QINGUA, its head.
QINGUAMIUT, the inhabitants of Qingua.
QIVITUNG, the hermit.
QOGNUNG, the narrow place.
QOGULORTUNG (Qaggilortung ?).
QORDLUVING, where the water runs in a solid stream.
QUAIIRNANG.
QUDJITARIAQ.

S.

SAGDLIRMIUT, the inhabitants of Sagdlirn.
SAGDLIRN, the island nearest the sea.
SAGDLUA, its Sagdlirn.
SAKIAQDJUNG, the little rib.
SARBAQ (*sarvaq*), the rapids.
SARBAQDJUKULU, the small rapids.
SARBAQDUALUNG, the large rapids.
SARBAUSIRN, the smaller rapids.
SARBUQDJUAQ, the large rapids.
SAUMIA, its left side.
SAUMINGMIUT, the inhabitants of Saumia.
SAUNIRTUNG, with many bones.
SAUNIRTUQDJUAQ, the great one with many bones.
SEDNIRUN, the yard.
SIEGTUNG, the scattered ones.
SIKOSUILAQ, the coast without ice.
SIKOSUILARMIUT, the inhabitants of Sikosuilaq.
SINI, the edge.
SINIMIUT, the inhabitants of Sini.
SIORELING, with sand.
SIRMILING, with a glacier.
SULUNG, the valley through which the wind blows howling.
SUROSIRN, the boy.

T.

TALIRPIA, its right side.
TALIRPINGMIUT, the inhabitants of Talirpia.
TAPPITARIAQ, the pass crossing two isthmuses.
TAPPITARIDJEN, the passes crossing two isthmuses.
TAQUIRBING.
TARIONITJOQ, the salt water basin.
TARRIONITUNG, the salt water basin.
TAʏOLIDJUIN.
TESSIUJANG, similar to a pond.
TIKERAQDJUAQ, the great point.
TIKERAQDJUAUSIRN, the smaller great point.
TIKERAQDJUNG, the small point.
TIKERAQDJUQ, the small point.
TININIQDJUAQ, the large beach.
TINIQDJUARBING, the great place with a high tide.
TINIQDJUARBIUSIRN, the smaller great place with a high tide.
TORNAIT, spirits.
TOUAQDJUAQ.
TUARPUQDJUAQ.
TUDJAN.
TUDJAQDJUAQ.
TUDJAQDJUARALUNG.
TUDJARAAQDJUNG.
TUKIA, its farthest corner.
TULUKAN, the ravens.
TUNIQTEN, those lying behind it.
TUNUKUTANG.
TUNUNIRMIUT, the inhabitants of Tununirn.
TUNUNIRN, the country lying back of something.
TUNUNIRUSIRMIUT, the inhabitants of Tununirusirn.
TUNUNIRUSIRN, the smaller Tununirn.
TUNUSSUNG, the nape.
TUPIRBIKDJUIN, the tent sites.

U.

UDLIMAULITELING, with a hatchet.
UGJUKTUNG, with many ground seals.
UGJULIK, with ground seals.
UGJULIRMIUT, the inhabitants of Ugjulik (the ground seal country).
UGLARIAQ.
UGLIRN, walrus island.
UGLIT, the walrus islands.
UIBARUN, the cape.
UJARAQDJUIN, the large stones.
UJARADJIRAAITJUNG; from *ujaraq*, stone.
UKADLIQ, the hare.
UKIADLIVING, the place where one lives in the fall.

UKIUKDJUAQ, the great winter.
UKUŠIKSALIK, the place with pot stone
UKUSIKSALIRMIUT, inhabitant of Ukusiksalik.
UMANAQ, the heart-like island.
UMANAQTUAQ, the great heart-like island.
UMINGMAN NUNA, the land of the musk ox.
UNGAVA.
UNGAVAMIUT.
USSUALUNG, the large penis.
UTIQIMITUNG.

APPENDIX.

After the preceding paper was in type some additional information was received from whalers who returned from Cumberland Sound in the autumn of 1887. In the following notes I give the substance of these reports:

NOTE 1.

Page 467. Since 1883 the whalers have been more successful, and consequently more ships visit the sound. In the present winter—1887–'88—one American and two Scottish whaling stations are in operation in Cumberland Sound; a new station was established in Nugumiut two years ago, and the Scottish steamers which used to fish in Baffin Bay and the northern parts of Davis Strait are beginning to visit Cumberland Sound and Hudson Strait. The whaling in Baffin Bay shows a sudden falling off and it seems that the number of ships will be greatly reduced. This cannot be without influence upon the Eskimo, who will probably begin again to flock to Cumberland Sound and Nugumiut.

NOTE 2.

Page 538. In 1884 and 1885 a lively intercourse existed between Padli and Cumberland Sound, and in the spring of the latter year the dog's disease broke out for the first time on the coast of Davis Strait, and spread, so far as is known, to the northern part of Home Bay.

NOTE 3.

Page 574. A peculiar game is sometimes played on the ice in spring. The men stand in a circle on the ice, and one of them walks, the toes turned inward, in a devious track. It is said that only a few are able to do this in the right way. Then the rest of the men have to follow him in exactly the same track.

One of their gymnastic exercises requires considerable knack and strength. A pole is tied with one end to a stone or to a piece of wood that is firmly secured in the snow. A man then lies down on his back, embracing the pole, his feet turned toward the place where the pole is tied to the rock. Then he must rise without bending his body.

In another of their gymnastic exercises they lie down on their stomachs, the arms bent so that the hands lie close together on the breast, palms turned downward. Then they have to jump forward without bending their body, using only their toes and hands. Some are said to be able to jump several feet in this manner.

NOTE 4.

Page 582. In the Report of the Hudson Bay Expedition of 1886, p. 16, Lieut. A. Gordon remarks that the same custom is reported from Port Burwell, near Cape Chidleigh, Labrador. He says: "There lived between the Cape and Aulatsivik a good Eskimo hunter whose native name is not given, but who was christened by our station men 'Old Wicked.' He was a passionate man and was continually

threatening to do some bodily harm to the other more peaceably inclined natives. * * * His arrogance and petty annoyances to the other natives became at length unbearable. It appears that these unfortunates held a meeting and decided that Old Wicked was a public nuisance which must be abated, and they therefore decreed that he should be shot, and shot he was accordingly one afternoon when he was busily engaged in repairing the ravages which a storm had made in his 'igdlu' or snow house. The executioner shot him in the back, killing him instantly. The murderer or executioner (one hardly knows to which title he is more justly entitled) then takes Old Wicked's wives and all his children and agrees to keep them * * * so that they shall be no burden on the company."

The fact that the custom is found among tribes so widely separated will justify a description of those events which came under my own observation. There was a native of Padli by the name of Padlu. He had induced the wife of a Cumberland Sound native to desert her husband and follow him. The deserted husband, meditating revenge, cut off the upper part of the barrel of his gun so that he could conceal it under his jacket. He crossed the land and visited his friends in Padli, but before he could accomplish his intention of killing Padlu the latter shot him. When this news was reported in Qeqerten, the brother of the murdered man went to Padli to avenge the death of his brother; but he also was killed by Padlu. A third native of Cumberland Sound, who wished to avenge the death of his relatives, was also murdered by him. On account of all these outrages the natives wanted to get rid of Padlu, but yet they did not dare to attack him. When the pimain of the Akudnirmiut in Niaqonaujang learned of these events he started southward and asked every man in Padli whether Padlu should be killed. All agreed; so he went with the latter deer hunting in the upper part of Pangnirtung, northwest of Padli, and near the head of the fjord he shot Padlu in the back.

In another instance a man in Qeqerten had made himself odious. After it was agreed that he was a bad man an old man of Qeqerten, Pakaq, attacked him on board a Scottish whaler, but was prevented from killing him.

Note 5.

Page 594. The following performance was observed in Umanaqtuaq, on the southwestern coast of Cumberland Sound, in the winter of 1886–'87: An angakoq began his incantations in a hut after the lamps were lowered. Suddenly he jumped up and rushed out of the hut to where a mounted harpoon was standing. He threw himself upon the harpoon, which penetrated his breast and came out at the back. Three men followed him and holding the harpoon line led the angakoq, bleeding profusely, to all the huts of the village. When they arrived again at the first hut he pulled out the harpoon, lay down on the bed, and was put to sleep by the songs of another angakoq. When he awoke after a while he showed to the people that he was not hurt, although his clothing was torn and they had seen him bleeding.

Another angakoq performed a similar feat on the island Utussivik in the summer of 1887. He thrust a harpoon through his body and was led by about twenty-five men through the village. It is said that he imitated the movements and voice of a walrus while on the circuit.

Still another exhibition was witnessed by the whalers in the fall of 1886 in Umanaqtuaq. An angakoq stripped off his outer jacket and began his incantations while walking about in the village. When the men heard him, one after the other came out of his hut, each carrying his gun. After a while the angakoq descended to the beach; the men followed him, and suddenly fired a volley at him. The angakoq, of course, was not hurt, and then the women each gave him a cup of water, which he drank. Then he put on his jacket, and the performance was ended. The similarity of this performance with part of the festival which is described on pp. 605 et seq. is evident.

NOTE 6.

Page 606. The same feast was celebrated in 1886 in Umanaqtuaq, in Cumberland Sound, where all the Talirpingmiut had gathered. The witnesses of this festival describe it exactly in the same way as I described it above. One thing ought to be added, which I did not mention because it seemed to me accidental, but as it was repeated in the same way in 1886 it must have some meaning. I noticed that the Qailertetang, after having invoked the wind, hop about, making a grunting noise and accosting the people. When doing so they are attacked by the natives and killed. According to the description of the whalers they imitate sometimes deer, sometimes walrus. Perhaps this fact gave rise to Kumlien's description of the "killing of the evil spirit of the deer." It is remarkable that in 1883 in Qeqerten and in 1886 in Umanaqtuaq the festival was celebrated on exactly the same day, the 10th of November. This can hardly be accidental, and does not agree with the idea sometimes advanced, that the festival refers to the winter solstice. Unfortunately Hall (I, p. 528) does not give the dates of the festival in Nugumiut. On the western coast of Hudson Bay a festival in which masks were used was celebrated about the end of January, 1866 (Hall II, p. 219), but it is hardly possible to draw conclusions from Nourse's superficial account of Hall's observations.

NOTE 7.

Page 615. It may be of interest to learn that in 1885 and 1886 two instances of this kind occurred in Cumberland Sound. There was a very old woman in Qeqerten by the name of Qaχodloaping. She was well provided for by her relatives, but it seems that one of the most influential men in Qeqerten, Pakaq, whom I mentioned above (p. 668) as the executioner of a murderer, deemed it right that she should die. So, although she resisted him, he took her out of her hut one day to a hill and buried her alive under stones. Another case was that of an old woman whose health had been failing for a number of years. She lived with her son, whose wife died late in the autumn of 1886. According to the religious ideas of the Eskimo, the young man had to throw away his clothing. When, later on, his mother felt as though she could not live through the winter, she insisted upon being killed, as she did not want to compel her son to cast away a second set of clothing. At last her son complied with her request. She stripped off her outside jacket and breeches, and was conveyed on a sledge to a near island, where she was left alone to die from cold and hunger. The son who took her there did not use his own sledge nor any other Eskimo sledge for this purpose, but borrowed that of the Scottish whaling station.

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